CIHR IRSC

Knowledge to Action

CIHR-Supported Health Research at Work for Canada and Canadians

CIHR Annual Report 2009–10

Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

Canada

Canadian Institutes of Health Research
160 Elgin Street, 9th Floor
Address Locator 4809A
Ottawa, Ontario K1A 0W9 Canada
www.cihr-irsc.gc.ca

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All people profiled in this annual report have agreed to their appearance in it and approved their individual stories.

Knowledge to Action

CIHR-Supported Health Research at Work for Canada and Canadians

CIHR is the Government of Canada's agency for health research. Its mandate is to *excel, according to internationally accepted standards of scientific excellence, in the creation of new knowledge and its translation into improved health for Canadians, more effective health services and products and a strengthened Canadian health care system.*

For the past 10 years, the Canadian Institutes of Health Research (CIHR) has supported better health and health care for Canadians. As the Government of Canada's health research investment agency, CIHR enables the creation of evidence-based knowledge and its transformation into improved treatments, prevention and diagnoses, new products and services, and a stronger, patient-oriented health-care system. Composed of 13 internationally recognized institutes, CIHR supports more than 13,600 health researchers and trainees across Canada.

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President's Message

It has been a very significant year for CIHR. In 2009–10, following extensive consultations, we launched *Health Research Roadmap: Creating innovative research for better health and health care*, a five-year Strategic Plan for CIHR.

Planning for *Roadmap* challenged us to consider areas of importance and strength in the Canadian health research enterprise and to ensure that CIHR delivers on its broad mandate.

Roadmap addresses our core strengths and values – such as commitment to research excellence, commitment to knowledge translation, commitment to ethically sound research – and lays out ways that we can increase our performance relative to each of these strengths and our value as a strategic partner in health research.

Through *Roadmap*, CIHR has set new challenges and will continue to innovate. The organization is currently finalizing an implementation plan for *Roadmap* to ensure that each of the plan's objectives is met and that progress towards them is tracked.

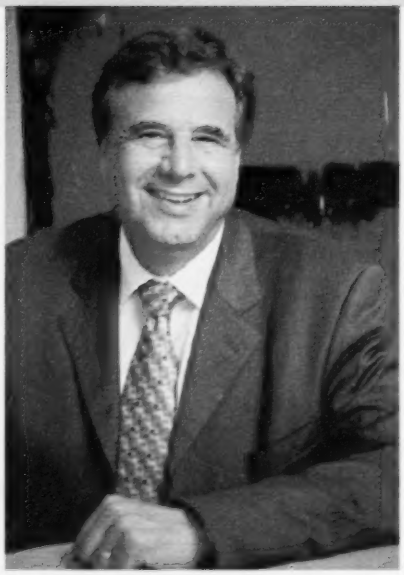
From an organizational perspective, the launch of the new Strategic Plan stands out as the major deliverable of the previous fiscal year. However, it is also worth noting several other accomplishments, each of which is described in further detail in the 2009–10 Annual Report.

As an example, CIHR has developed a comprehensive new strategy to address the need for greater patient-oriented research in Canada. CIHR also responded to both the H1N1 outbreak and the isotopes shortage, fast-tracking the launch of investment into targeted research on both of these important topics. In one case, a team of researchers from the University of Sherbrooke has already reported progress in finding alternative means of producing Technetium 99m. Globally, CIHR joined with five other national health research councils to form the Global Alliance for Chronic Diseases initiative to collaborate in the critical battle against chronic, non-communicable diseases.

In addition, CIHR-supported researchers can also be proud of a number of major research accomplishments, a selection of which are also listed in this report.

Finally, to recognize the value of health research and to continue sending the message that health research delivers impact, we have also chosen to use the Annual Report to provide an update on four research projects that help illustrate the transformation of knowledge into action.

One of the unique characteristics of the research enterprise is that it can often take years before impact is felt. With this Annual Report, we wanted to balance the picture of planned and current activities with a picture of what health research can achieve through knowledge translation.

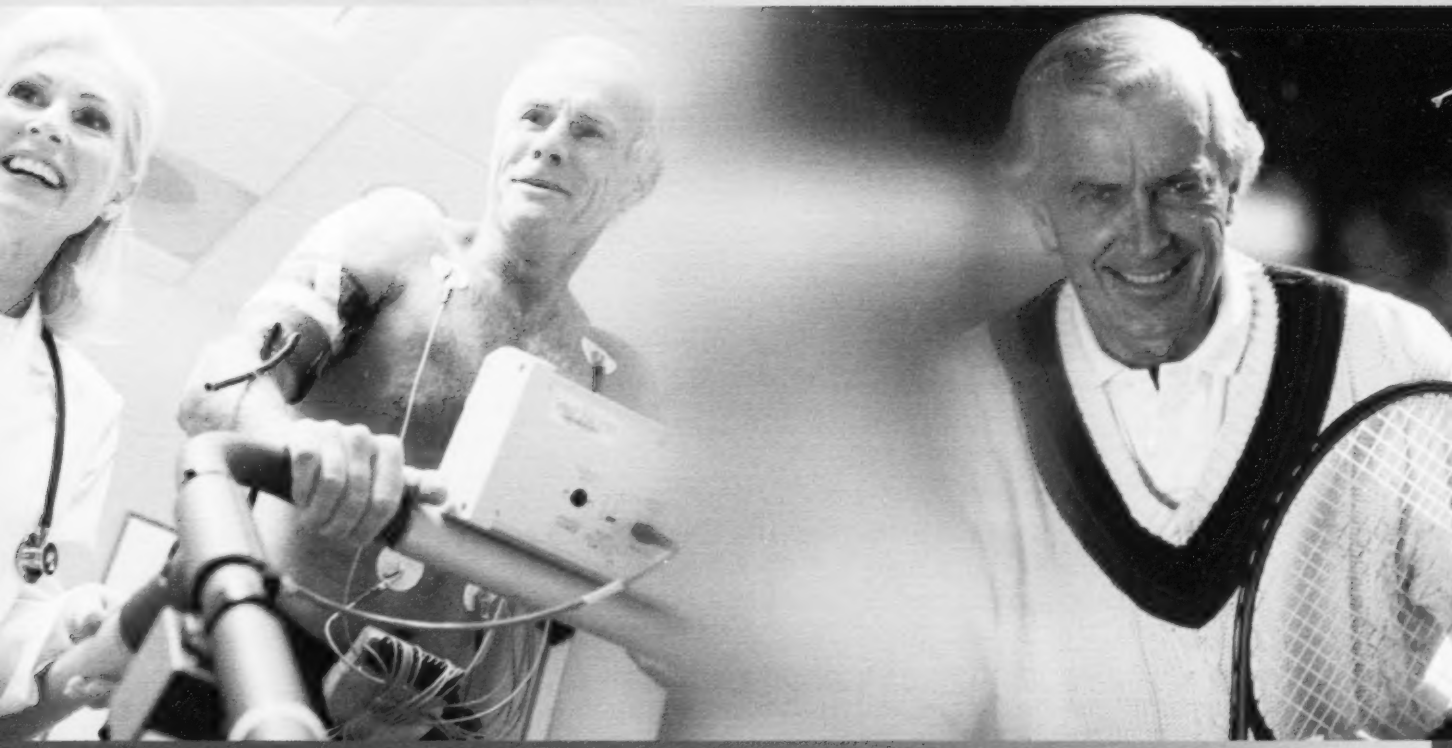


Alain Beaudet, MD, PhD

Moving forward, CIHR is an organization with a clear new Strategic Plan and a commitment to putting knowledge into action.

Alain Beaudet, MD, PhD
President, Canadian Institutes of Health Research

Putting Knowledge into Action



When CIHR was established, the *CIHR Act* included explicit reference to knowledge translation (KT), a concept and practice particularly pertinent to the research environment.

KT is integral to the research process and an important aspect of CIHR's work. In the new five-year Strategic Plan, we have reinforced our commitment to KT to ensure that Canadians achieve the full value of investments in health research made on their behalf.

KT is about making users aware of new knowledge and helping them use it to improve the health of Canadians and the health-care system.

For example, research teams have been synthesizing recent health research information to pinpoint the findings that, when put into practice, are likely to have an impact on improving the health of Canadians. Similarly, other teams are already at work with decision and policy makers in taking high-impact research evidence and using it to change health-care practices. Other activities have focused on partnership building, engaging the public and helping researchers commercialize the results of their work.

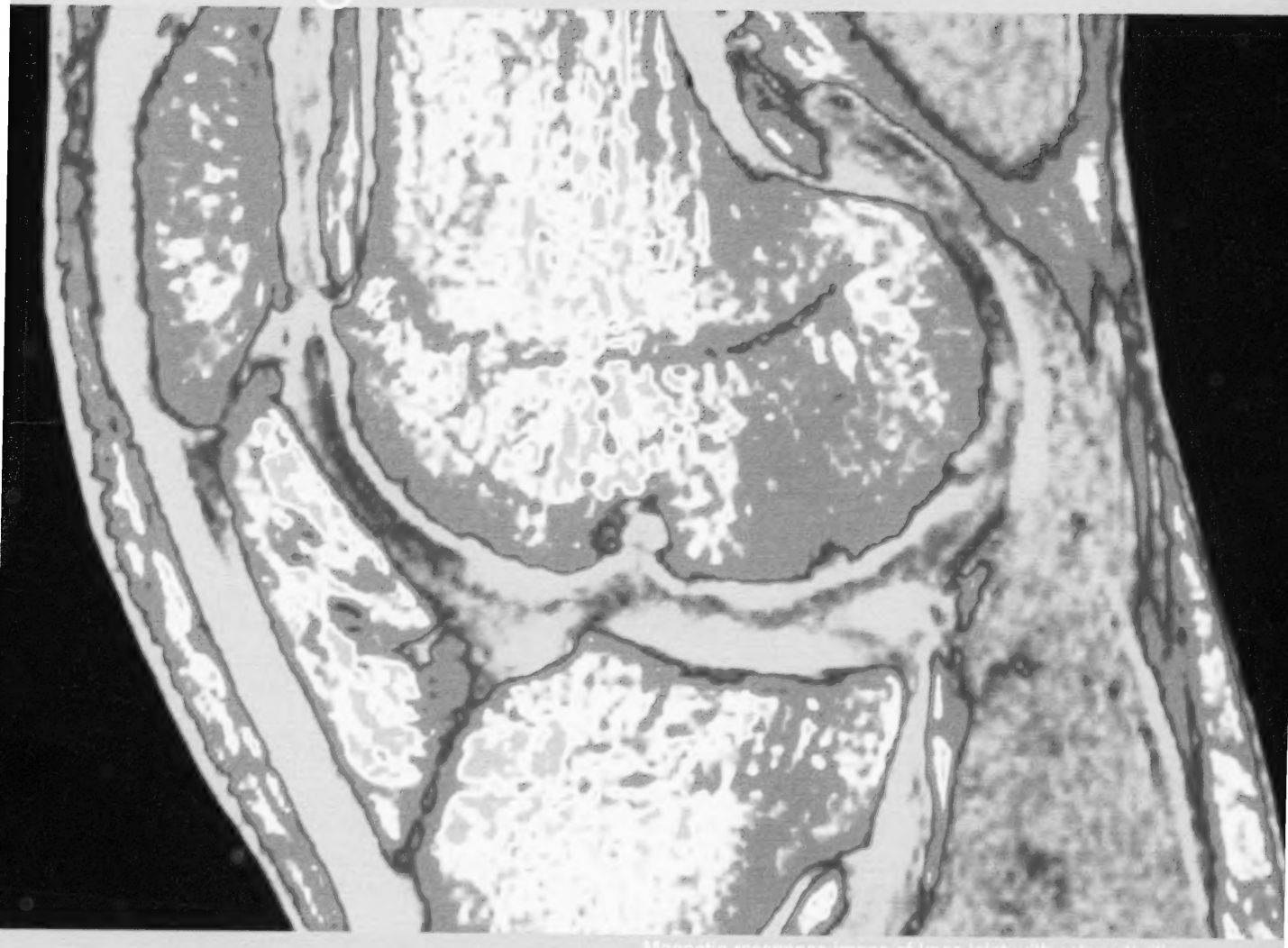
KT is all about turning research into action. It's about closing the gap between knowing and doing. It's about accelerating the capture and practical application of the knowledge uncovered by research.

When knowledge is turned into action, it can have a number of powerful impacts such as:

- informing decision making and policy development
- capacity building
- health benefits (prevention, diagnostics, treatment, palliation)
- health-system improvements
- technology transfer

In the following section, we have provided detailed accounts of four projects that reflect these types of impacts and demonstrate the transition from knowledge to action.

Beyond Damage Control



Magnetic resonance image of knee joint with osteoarthritis

Making a (Bio)mark on Arthritis

What if you had a painful disease that doctors told you couldn't be treated? Or, what if you were given a drug with no assurances that it would actually work on your condition?

Welcome to life with arthritis.

There are currently no therapies that can stop the progress of osteoarthritis – the most common form of arthritis – in which cartilage lining the joints deteriorates and the bones chafe against each other. Its onset is often painless and difficult to detect before much damage has been done. While there are drugs for rheumatoid arthritis – in which the body's immune system attacks healthy tissue, damaging joints, inflaming cartilage and causing pain and swelling – it can take a year to tell whether a therapy is preventing joint destruction. It's a problem for patients, doctors and the companies trying to develop treatments.

CIHR-funded researcher **Dr. Robin Poole**, Emeritus Professor at **McGill University**, has dedicated four decades of his life to the battle against arthritis, directing the Joint Diseases Laboratory at Montreal's Shriners Hospital for Children from the lab's inception in 1977 until he retired in 2005.

More than 4 million Canadians aged 15 years and over have some form of arthritis.

The challenge

Efforts to find treatments have been hampered by the often slow or unpredictable way arthritis takes hold and develops, especially in the case of osteoarthritis.

The response

McGill's Dr. Robin Poole has found biomarkers that can detect the presence of osteoarthritis before the damage is done and identify which patients will likely show a quicker progression of the disease for inclusion in clinical trials of new therapies.

The numbers

According to the Canadian Arthritis Network, more than **4 million Canadians aged 15 years and over** have some form of arthritis and **100,000 cases are diagnosed each year**. The economic burden of arthritis in Canada is estimated at **$4.4 billion annually**, with long-term disability and lost productivity accounting for almost **80% of the costs**.

CIHR role

Support for research carried out by Dr. Poole and investment in the Canadian Arthritis Network.

Dr. Robin Poole

What is a biomarker?

A biomarker is any physical trait that can point to the presence or progress of a disease or condition – the way a raised temperature signals a child's fever.

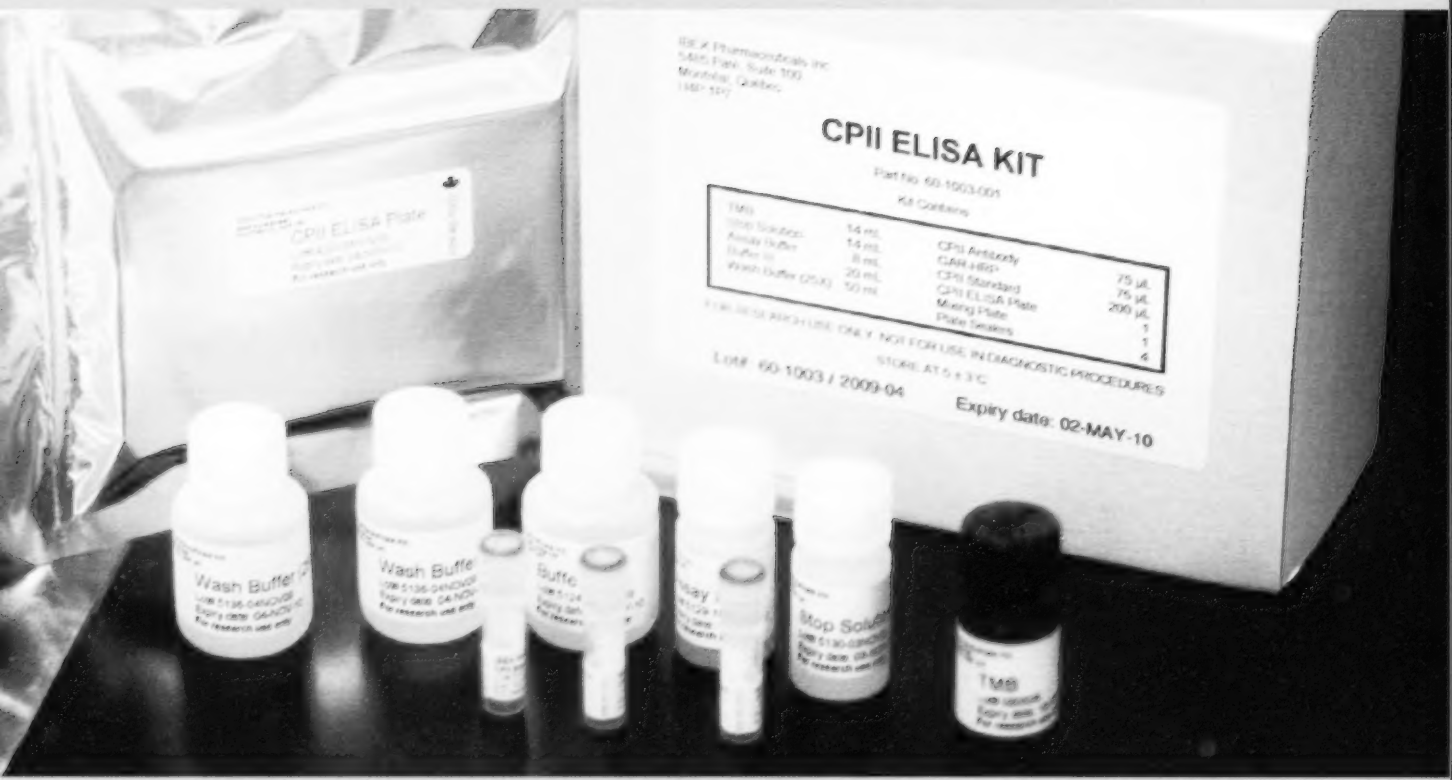
Dr. Poole's work, with colleagues in the Canadian Arthritis Network, funded by CIHR through the NCE program, and as part of international collaborations, has led to new ways to detect the presence of osteoarthritis before it does any damage and see, after only a few weeks, whether drugs for rheumatoid arthritis are offering protection against joint destruction. Further, he has helped a Canadian company become a leading international producer of the toolkits used for early detection of osteoarthritis and monitoring disease activity in all patients with arthritis.

This work is now proving instrumental in helping the recruitment of osteoarthritic patients for clinical trials for new arthritis treatments and is benefiting researchers and pharmaceutical firms alike.

Research Response

In health research, biomarkers are specific biochemicals with unique molecular qualities that can be used to measure the presence or progress of a disease. Dr. Poole's approach has been to identify signs of joint tissue breakdown and synthetic products found in blood and urine that indicate the impact of arthritis and assess the short-term effects of treatments.

Dr. Poole identified a single serum and urine biomarker called C2C that can measure collagen deterioration in cartilage in osteoarthritis and rheumatoid arthritis. Working with **Drs. Jolanda Cibere** and **John Esdaile** of the **University of British Columbia**, he found that C2C and other biomarkers he has developed can



Osteoarthritis assay kit

be used singly and in combination to help detect the early onset of osteoarthritis when there are no apparent symptoms.

With **Dr. Leena Sharma** of **Northwestern University** in Chicago, Dr. Poole developed a blood test to identify the progression of osteoarthritis. The blood test can identify those patients who are more likely to show progression of osteoarthritis, which is critical information for selecting the right persons to include in clinical trials.

"One of the problems in conducting clinical trials with arthritis is that often only 15–25% of the patients actually show the progression of joint destruction over a one- to two-year period," says Dr. Poole. "Using biomarkers to identify those patients who likely will show progressions – as opposed to recruiting a random population – is really quite exciting."

Results

Dr. Poole's biomarker discoveries were patented, and a Montreal-based biotech company has licensed the technology. "Dr. Poole's contribution has helped us considerably," says **Mr. Paul Baehr**, President and CEO of **IBEX Technologies**. IBEX has developed a product line of arthritis assays (kits to determine the presence and amount of different substances in blood and urine that indicate joint disease activity) based on Dr. Poole's research. Mr. Baehr estimates the assays make up a quarter of company revenues and help keep it profitable – no mean feat in a biotech industry in which new technologies take time to become established.

The assays are used by academic researchers who are looking into disease mechanisms and by industrial clients doing early stage drug development as well as preclinical and clinical trials for rheumatoid arthritis and

"The last couple of years, I've been involved in helping prepare a document for the US Food and Drug Agency to help guide development of new drugs in the treatment of osteoarthritis."

Dr. Room Poole

osteoarthritis therapies. "The biggest volume of our assay sales comes from industry clients the pharmaceutical companies," says Mr. Baehr.

For Dr. Poole, a co-founder of the Canadian Arthritis Network, its former Scientific Director and a recipient of a Lifetime Achievement Award from the Osteoarthritis Research Society International, the work carries on.

"The last couple of years, I've been involved in helping prepare a document for the US Food and Drug Agency to help guide development of new drugs in the treatment of osteoarthritis," he says. "It includes a white paper on the use and application of biomarkers. This is the first guidance document impacting clinical trials for osteoarthritis in many years."

In essence, his work has set the stage for the next generation of researchers to find treatments for osteoarthritis, a debilitating disease that has so far frustrated the best efforts to unlock its secrets.

That it has taken decades for his discoveries to be transformed into products and procedures doesn't surprise him. "Research is very much like fine art. It sometimes takes people a while to catch on to the new opportunities," says Dr. Poole. "All of these activities are now translating what we have discovered into practical applications."

"With a small company, any additions to the product line and revenues are very meaningful. In addition to the assays we currently market, there are new assays that will flow from patents that are in the process of being filed on work initiated by Dr. Poole."

Mr. Paul Baehr, President and CEO of IBEX Technologies

Acting on the Need to Know

Using Research to Change Health Policy

There are few things as wasteful as an unread research report. The time, talent and money invested in it are for naught if the information produced isn't put to good use.

In health services – where the demands are unlimited but the budgets are fixed – producing reports that collect dust is something no one can afford.

Dr. Patricia Martens, Director of the **Manitoba Centre for Health Policy**, understands this better than most. Her Centre, part of the University of Manitoba's Faculty of Medicine, produces several research reports each year examining health services and population health. But until the Centre changed its approach and began doing a better job of reaching out to the people who can put information to work, those reports often were left to sit on shelves.

Until the late 1990s, this was the situation facing the Centre's researchers and the decision makers who manage health care at Manitoba's Regional Health Authorities. Managers often felt what they were learning from the reports wasn't applicable to their needs. So, when it came time to make plans, they often based decisions on previous practices and anecdotal evidence.

Things are different now. "On every research project, we try to incorporate the decision makers in a working group scenario all along the way to make sure we're getting it right," says Dr. Martens. "Then we don't really have to push it (the research) out the door. It automatically gets used because of the process."

the budgets are fixed – producing reports that collect dust is something no one can afford.

The challenge

Because communication between researchers at the Manitoba Centre for Health Policy and the Regional Health Authorities was limited, research was not being put to use.

The response

Dr. Patricia Martens created *The Need to Know Team*, which brings researchers and Regional Health Authorities together to decide on and execute research projects.

CIHR role

Provided a five-year team grant to support the creation of *The Need to Know Team*.

Dr. Patricia Martens

Who needs to know?

In a unique collaboration between the research generators and end-users, *The Need to Know Team* is made up of researchers and graduate students from the Manitoba Centre for Health Policy, representatives of the Regional Health Authorities and planners from Manitoba Health.

Research Response

Recognizing the need to involve the Regional Health Authorities in the research process from conception to completion, Dr. Martens, successfully secured CIHR funding in 2001 to create *The Need to Know Team*.

The *Team*, with two decision makers from each of the 11 Regional Health Authorities and planners from Manitoba Health, works alongside researchers to choose and conduct the Centre's research projects. The projects focus on strengthening health services and improving population health by analyzing data available through anonymized administrative records.

In what has become a truly collaborative approach, the *Team's* Regional Health Authority members have gained new understanding of just how research is done while the researchers have learned about the hard realities of day to day decision making in the regions.

The Need to Know Team

Results

Working with the Centre's researchers, *The Need to Know Team*, now co-directed by Dr. Martens and **Dr. Randy Fransoo**, has co-authored two iterations of *The Manitoba Regional Health Authority Indicators Atlas* (2003, 2009), a comprehensive examination of health status, health-care use and quality of care for Manitobans.

Realizing that the Regional Health Authorities needed more information on the extent of mental illness and its impact on health care, *The Need to Know Team* co-authored *Patterns of Regional Mental Illness Disorder Diagnoses and Service Use* in 2004. They also helped produce *What Works? A First Look at Evaluating Manitoba's Regional Health Programs and Policies at the Population Level* in 2008.

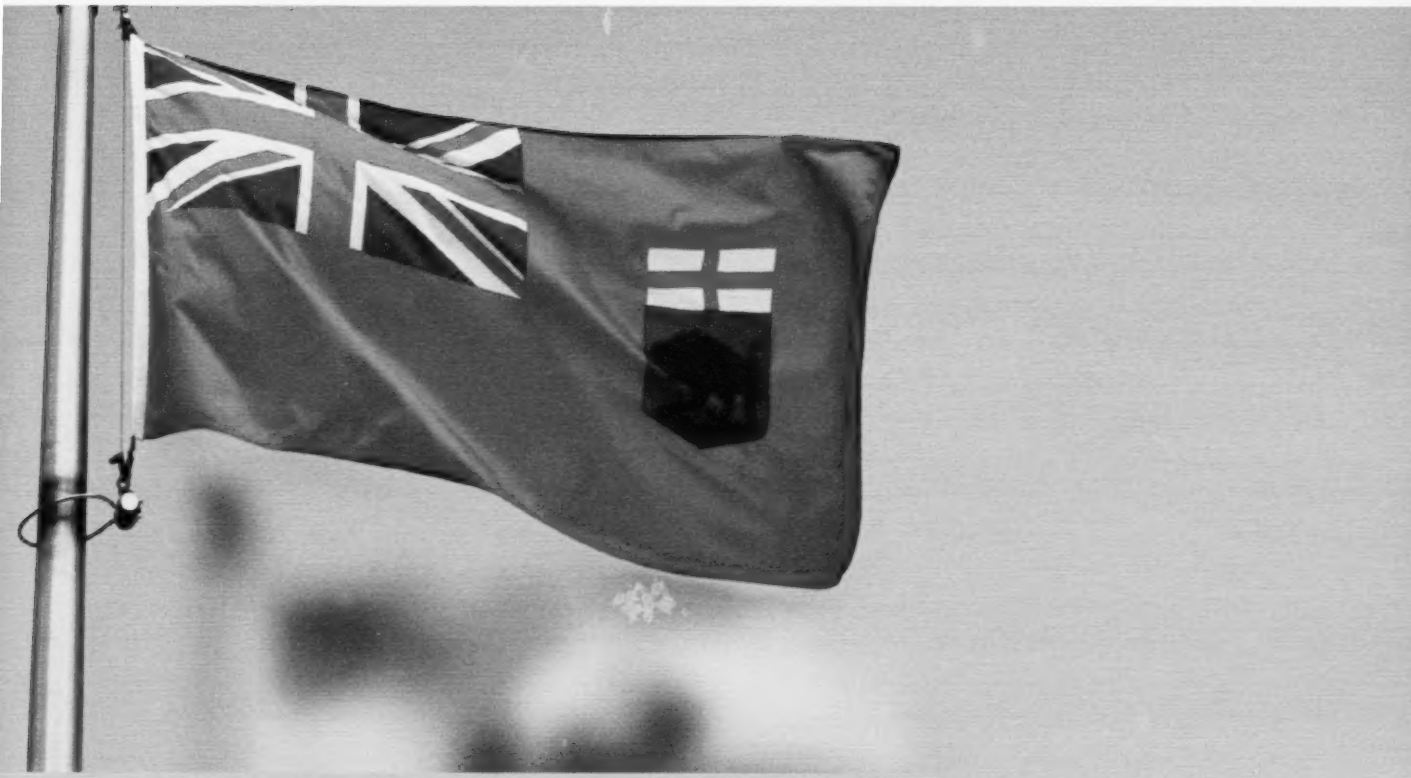
The Regional Health Authorities use the *Atlas* to examine how their programs are performing.

"As an example, from data on diabetes and chronic diseases in the *Atlas* we could tell which of our districts had poorer outcomes," says **Ms. Kathy McPhail**, CEO of the **Central Manitoba Regional Health Authority**. "We looked at our program and placed more resources in the districts with the poorest indicators. We just finished doing that about six months ago, but I expect we will have significant outcome improvements."

Ms. McPhail says her board is in the process of drawing up its next five-year strategic plan, and the Centre's research will colour both the broad strokes and fine details. "Our board, and I'm sure other boards, really utilize those statistics," says Ms. McPhail.

"Our whole philosophy is health planning based on evidence."

Ms. Arlene Wilgosh



The *Team* is also having an impact on how Manitoba manages health care, says **Ms. Arlene Wilgosh**, former Manitoba Deputy Minister of Health.

"Our whole philosophy is health planning based on evidence, so you need that data, you need the information," says Ms. Wilgosh, who recently became CEO of the **Winnipeg Regional Health Authority**. "It helps, if it's all based on information, when we're arguing to give health more money."

Ms. Wilgosh says that over the years, the research reports have "influenced our decisions around resources." She cites 2004's mental health report and 2008's *What Works?* evaluation of programs and policies as particularly helpful. "They showed what the evidence is and how you can apply it," she says.

Says Dr. Martens: "We have a really great team approach in Manitoba with the researchers, the regional decision makers and the provincial government all working together to get things working better. We give the impetus for people to figure out what needs to be changed. The bottom line is we want evidence-informed decision making."

"Having people on the ground who are involved in system care and management be involved in doing research is great because it instills in our providers a natural curiosity. So, they're asking questions about how they're doing the work and if there is a better way to do the work."

Ms. Arlene Wilgosh, former Manitoba Deputy Minister of Health

One Every 10 Minutes

Heart & Stroke Big Bike

A Research-led Revolution Is Improving Stroke Care Across Canada

Ten years ago, if you had a stroke in Canada, your chances of surviving and making a complete recovery depended largely on luck.

You were lucky if the emergency room doctors were up to date on using clot-busting drugs. Such drugs can reopen blocked blood vessels and reduce brain damage if given within hours of the most common form of stroke.

You were very lucky if your hospital had a designated stroke unit with an expert team of doctors and nurses ready to provide specialized care. And if you had a transient ischemic attack – often called a mini stroke – you were lucky to get coordinated follow-up care. Mini strokes often predict major strokes.

Over the past decade, however, stroke treatment in Canada has been undergoing a revolution, providing proof of how evidence-based research, when effectively integrated into clinical practice, saves lives, reduces disabilities and eases the economic burden on the health-care system.

The Public Health Agency of Canada estimates about $3.6 billion is spent on stroke annually.

The challenge

Across Canada, there has been a lack of standardization of stroke care, limited use of a new drug treatment and little follow-up care for people at risk of major strokes. Until recently, few cities had hospitals with designated stroke units.

The response

Calgary's Dr. Michael Hill is part of a revolution in stroke care in which evidence-based research is driving changes in clinical practice to save more lives, reduce disabilities and provide more efficient treatment.

The numbers

About **50,000 Canadians** have a stroke each year – **one every 10 minutes**.

CIHR role

Support for several key clinical trials involving stroke treatment protocols and investment in the Canadian Stroke Network, which has helped revolutionize stroke treatment in Canada.

Photo courtesy of Chris Kondratsky, University of Calgary

Dr. Michael Hill

What is a stroke?

Often called a "brain attack," an ischemic stroke disrupts the normal flow of blood and oxygen to the brain. The result: oxygen-deprived cells die.

Dr. Michael Hill, an Associate Professor at the **University of Calgary**, has been a leader in that revolution. A practising neurologist at Calgary's Foothills Medical Centre, he has been a leading advocate of applying evidence-based clinical research for standardized stroke care.

Research Response

Funded by CIHR since 2001, Dr. Hill has led some of Canada's most important research projects in stroke and is a lead author of national guidelines on its treatment. In 2005, he led a major study that tracked more than 1,100 patients and showed that a clot-busting drug known as tissue plasminogen activator, approved by Health Canada in 1999, is a safe, effective therapy for ischemic stroke (the most common form of stroke, in which blood flow to the brain is interrupted). Dr. Hill co-authored a 2008 study warning that people with mini strokes are at risk for major ones and should receive blood-thinning therapy and follow-up preventive care.

Stressing that "knowledge translation is never the result of one person," Dr. Hill is keen to point out that he is just one person in "a community of people across Canada" trying to improve stroke care. A key piece in this community is the Canadian Stroke Network, funded by CIHR through the Networks of Centres of Excellence program.

"In terms of the big picture, **Dr. Antoine Hakim**, CEO of the **Canadian Stroke Network**, is the leader. In Ontario, which was really the vanguard province in this, it

Tissue plasminogen activator

was **Dr. Frank Silver** at the **University of Toronto** who, along with the **Heart and Stroke Foundation of Ontario**, made the case to the Government of Ontario to get organized. And **Dr. Ashfaq Shuaib** of the **University of Alberta** has been key: as Chair of the Education Committee of the **Canadian Stroke Consortium** (a national network of neurologists), he has played a big role."

Dr. Hill is also a major contributor to the Canadian Stroke Strategy, a joint initiative of the Heart and Stroke Foundation and the Canadian Stroke Network to encourage an integrated approach to stroke prevention, treatment and rehabilitation across the country. He is a lead author of the *Canadian Best Practice Recommendations for Stroke Care*. Revised every two years, the guidelines are published in the *Canadian Medical Association Journal* and disseminated to physicians and other health-care professionals across the country.

On his home turf, Dr. Hill helped create the Calgary Stroke Program and advocated for the Alberta Provincial Stroke Strategy, a province-wide system of stroke care.

"Stroke-related neurological disability is so expensive to care for after the fact," he says. "If you can deal with it at the front end – make patients better through better acute care or by preventing the stroke in the first place – then you can also save a lot of money."

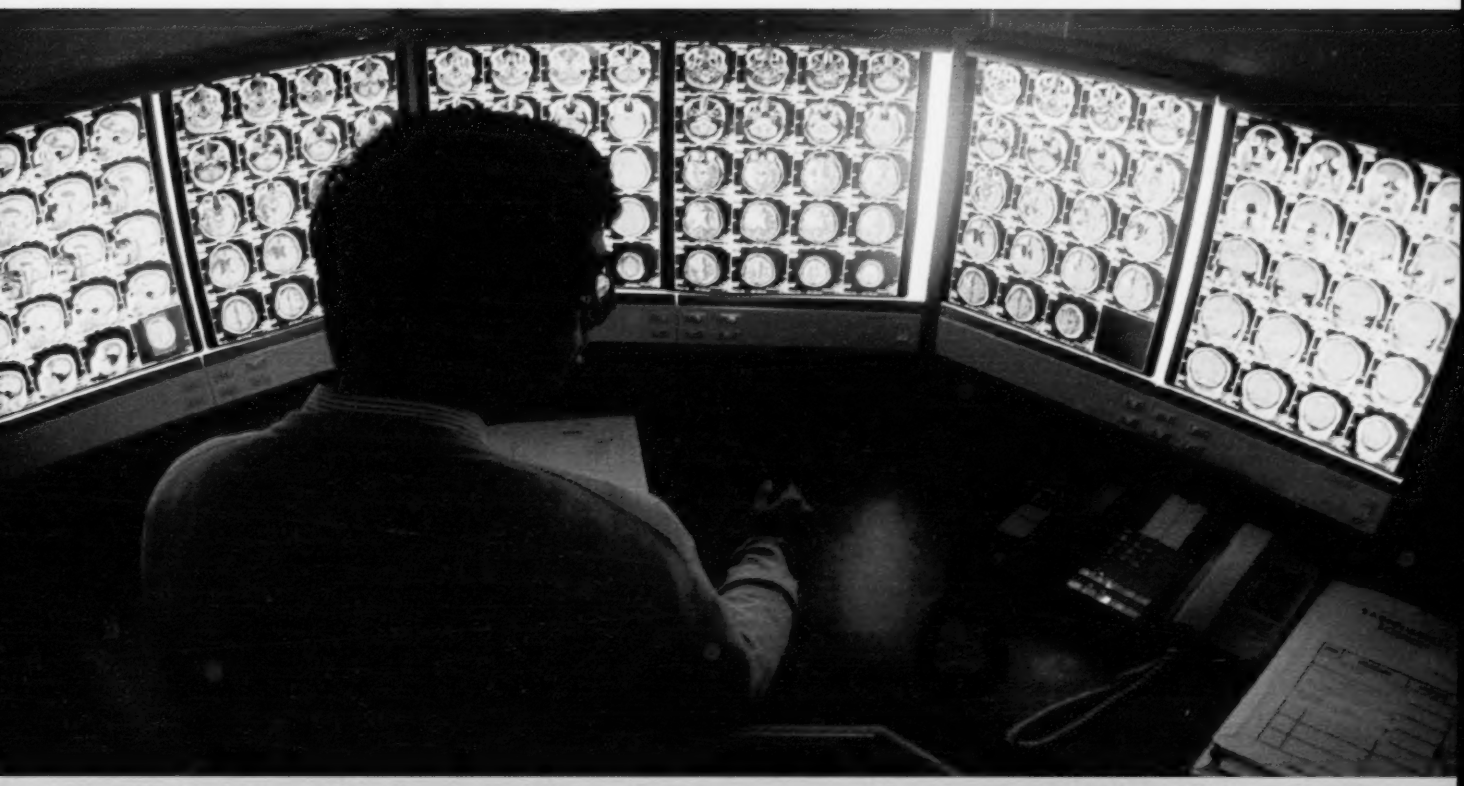
Ms. Joan Berezanski, an Executive Director with **Alberta Health and Wellness**, says Dr. Hill has made an important contribution. "He did very key work that fit into the provincial strategy. We needed this research."

Results

While there are no national statistics for tissue plasminogen activator use in stroke, Ontario regional stroke centres report a jump in its application. Alberta also has seen a

"Stroke-related neurological disability is so expensive to care for after the fact."

Dr. Michael Hill



significant increase in the use of this drug. The key recommendations for follow up treatment of transient ischemic attacks have been incorporated into the *Canadian Best Practice Recommendations*.

As for proving the effectiveness of designated stroke units, Dr. Hill and his colleagues at Foothills compared data for stroke patients on general neurology/medical wards to those on a stroke ward and found the designated units cut the average length of stay to 15 days from 19 days. Given that the average acute care costs are about $27,500 per stroke, this represents noticeable savings. And the stroke unit care is better: fatalities were reduced by 4.5%.

As part of his knowledge translation efforts, Dr. Hill has been a frequent guest speaker on acute stroke care, including appearances at annual conferences of the Canadian Stroke Consortium where neurologists, internists and emergency room physicians discuss the latest research developments.

"A really important concept that many people don't get is the integration of research and clinical care," says Dr. Hill. "They are just so inextricably linked."

"Dr. Hill is a leader clinically and he has a fabulous willingness to contribute to and promote knowledge translation."

Ms. Elizabeth Woodbury, Executive Director of the Canadian Stroke Strategy

Solving Malnutrition a Single Serving at a Time

Sachets of Sprinkles in different languages

Knowledge Translation That Helps Children Thrive

Dr. Stanley Zlotkin's concern for kids in the developing world goes back to his medical school days.

"In my final year, I did a three-month elective in Nigeria where I got a glimpse of the big picture of health issues," says the now 62-year-old Dr. Zlotkin, a Senior Scientist at Toronto's **SickKids Hospital Research Institute**. "After that, I looked for opportunities."

His big opportunity came in 1996 when UNICEF challenged the pediatric nutrition community to come up with a solution to the global dilemma of childhood anemia and vitamin deficiencies.

Children in many developing countries around the world may not be starving, but they aren't getting the nutrients they need to thrive. The World Health Assembly ranks the control of vitamin and mineral deficiencies as the number two global health priority, second only to HIV/AIDS.

Efforts to combat childhood micronutrient malnutrition, however, have had very limited success. Supplements in syrups and drops are unpopular because they are difficult to measure, have a metallic taste and stain teeth and clothes.

"It's a huge problem," says Dr. Zlotkin. "But I love the idea of problem solving and I love to be able to see the research that I take on have a very practical application."

According to the United Nations, micronutrient malnutrition affects 750 million children.

The challenge

Children in many developing countries don't get the nutrients they need to develop to their full potential. Micronutrient malnutrition is blamed for about half of childhood deaths in the developing world and leads to anemia and pediatric cognitive and physical disabilities.

The response

Dr. Stanley Zlotkin of SickKids Hospital in Toronto created and developed Sprinkles to prevent and treat micronutrient deficiencies among young children and other groups at risk.

The numbers

Per sachet cost of Sprinkles: **about 2 cents**. UNICEF is currently **working with approximately 30 countries** to initiate or scale up the use of Sprinkles.

CIHR role

Support for research testing effectiveness of Sprinkles and major award for Dr. Zlotkin for accomplishments in knowledge translation.

Dr. Stanley Zlotkin

What are Sprinkles?

Sprinkles are sachets that contain a blend of powdered micronutrients. Adding Sprinkles to almost any food will fortify it without altering its taste.

Research Response

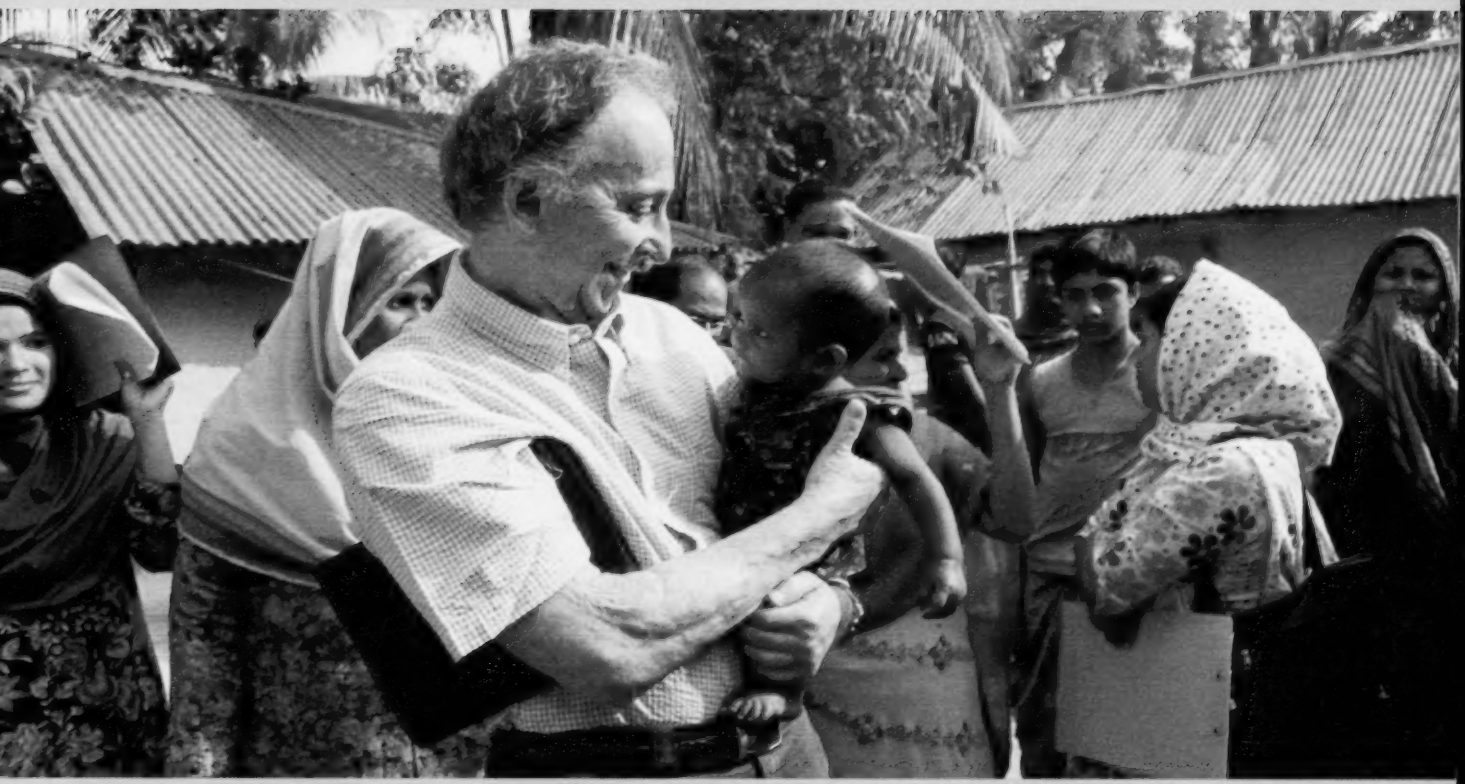
Sitting in his SickKids office, Dr. Zlotkin came up with "a one-page concept" for a tasteless and odourless micronutrient powder called Sprinkles that could be packaged in single-serving sachets like sugar packets and added to almost any food.

The idea intrigued him and he was prepared to roll up his sleeves, both literally and figuratively, to make it work. He test-produced the powdered mixture at night in the SickKids kitchen, after the cook and his crew had gone home. "In order to do research, I had to have the product. So, I had to make the product – this mixed concoction of vitamins and minerals – in the hospital kitchen at night."

Getting the H.J. Heinz Company on board as a research funder and partner for the production of sachets was, he says, pure serendipity.

"They were looking for a project to support. This fit their needs well and it fit my needs because Heinz makes things – like ketchup and vinegar – and puts them in sachets. They were willing to help with the technical component and their foundation was willing to support the research."

With a private sector partner in place and a product in hand, Dr. Zlotkin still had to sell UNICEF and other global aid agencies on Sprinkles. "I made it my business to go to



New York twice a year to visit UNICEF to give them updates on the research and to remind them that when we reached a certain stage it was going to be their responsibility to take this on."

He also had to show the developing countries that Sprinkles was a good thing. He began the first research study to prove Sprinkles' efficacy in Ghana in 1999, a project supported by CIHR. Similar research projects have been organized in more than a dozen countries including Bangladesh, Benin, Bolivia, China, Guyana, Haiti, India, Indonesia, Kyrgyzstan, Mexico, Pakistan and Vietnam.

The Sprinkles program – which became the Sprinkles Global Health Initiative – was implemented on a large scale in 2001 in Mongolia, a country whose children had unacceptable rates of anemia and rickets (a condition stemming from vitamin D deficiency).

UNICEF is currently working with approximately two dozen countries – primarily in Asia and Latin America – to initiate or scale up the use of Sprinkles.

Results

Today, hundreds of millions of Sprinkles single-serving sachets of micronutrients have been supplied to children around the world.

In Mongolia, large-scale use of Sprinkles resulted in significant reductions in anemia (38%) and vitamin D deficiency (28%) over four years.

Ms. Nita Dalmiya, a nutrition specialist with **UNICEF**, says Sprinkles is not only a low cost way of addressing pediatric anemia, it also provides an entry point to talk to mothers about their children's nutrition.

"That has the potential to make a huge difference to malnutrition rates," says Ms. Dalmiya. "For us, Sprinkles, or multiple micronutrient powders as we refer to them generically, is a promising approach for us to address childhood nutrition problems in many countries."

The partnership with Heinz, meanwhile, remains strong.

"Importantly to Heinz, Dr. Zlotkin directed much of his research and routinely ventured into the field to learn first hand about the

Today, hundreds of millions of Sprinkles single-serving sachets of micronutrients have been supplied to children around the world.

issues," says **Mr. Jack Runkel**, an H.J. Heinz Company Vice President and Chairman of the **H.J. Heinz Company Foundation**. "In fact, we affectionately referred to him as a missionary for the cause."

To broaden Sprinkles' reach, Dr. Zlotkin and Heinz have put the technical specifications in the public domain outside of Canada and the United States so that manufacturers can produce it without paying royalties. About 15 million children received Sprinkles – or some form of the micronutrient powder – in 2009.

In recognition of these partnership building efforts and his tireless work to facilitate the use of Sprinkles, in 2006 Dr. Zlotkin was awarded a prestigious CIHR Health Research Award for Knowledge Translation.

Dr. Zlotkin admits he had "no idea of what was going to happen" when he took up the challenge 14 years ago.

"I remember, early on, drawing a map and thinking, 'OK, if I do *this* and *this* and *this*, what's going to happen over the next six or seven years? Well, if it all falls into place, then UNICEF will take it on and make it part of their programming so that we can reach millions of children. I did have that vision. It just took longer than I anticipated."

"The work that Dr. Zlotkin has published, and that of other collaborators in consultation with him, this is what informs most of the program's introduction and scale-up in many of these countries. We have taken that work, taken the best lessons from it and applied it."

Ms. Nita Dalmiya, UNICEF Nutrition Specialist

Organizational Highlights 2009–10

Launch of CIHR's 2009–14 Strategic Plan

A new Roadmap for CIHR's future

CIHR released *Health Research Roadmap: Creating innovative research for better health and health care*, the new five-year Strategic Plan for the organization. *Roadmap* outlined four strategic directions: invest in world-class research excellence; address health and health system research priorities; accelerate the capture of health and economic benefits of health research; and achieve organizational excellence, foster ethics and demonstrate impact. These strategic directions will enable CIHR to carry out its full mandate, show leadership within the wider health research community, and demonstrate accountability and results to the people of Canada. Separate implementation plans will be published annually, describing specific objectives to be met and providing performance metrics to measure progress.

Developing new sources of medical isotopes

Health Minister Leona Aglukkaq announced that the Government of Canada is committing funding to develop alternatives to the medical isotopes produced at the aging Chalk River nuclear reactor. This research initiative is a partnership between CIHR and the Natural Sciences and Engineering Research Council of Canada. Seven projects across Canada are receiving a total of $54 million to seek non-nuclear reactor technology alternatives to Technetium-99m, an isotope commonly used in medical imaging procedures.

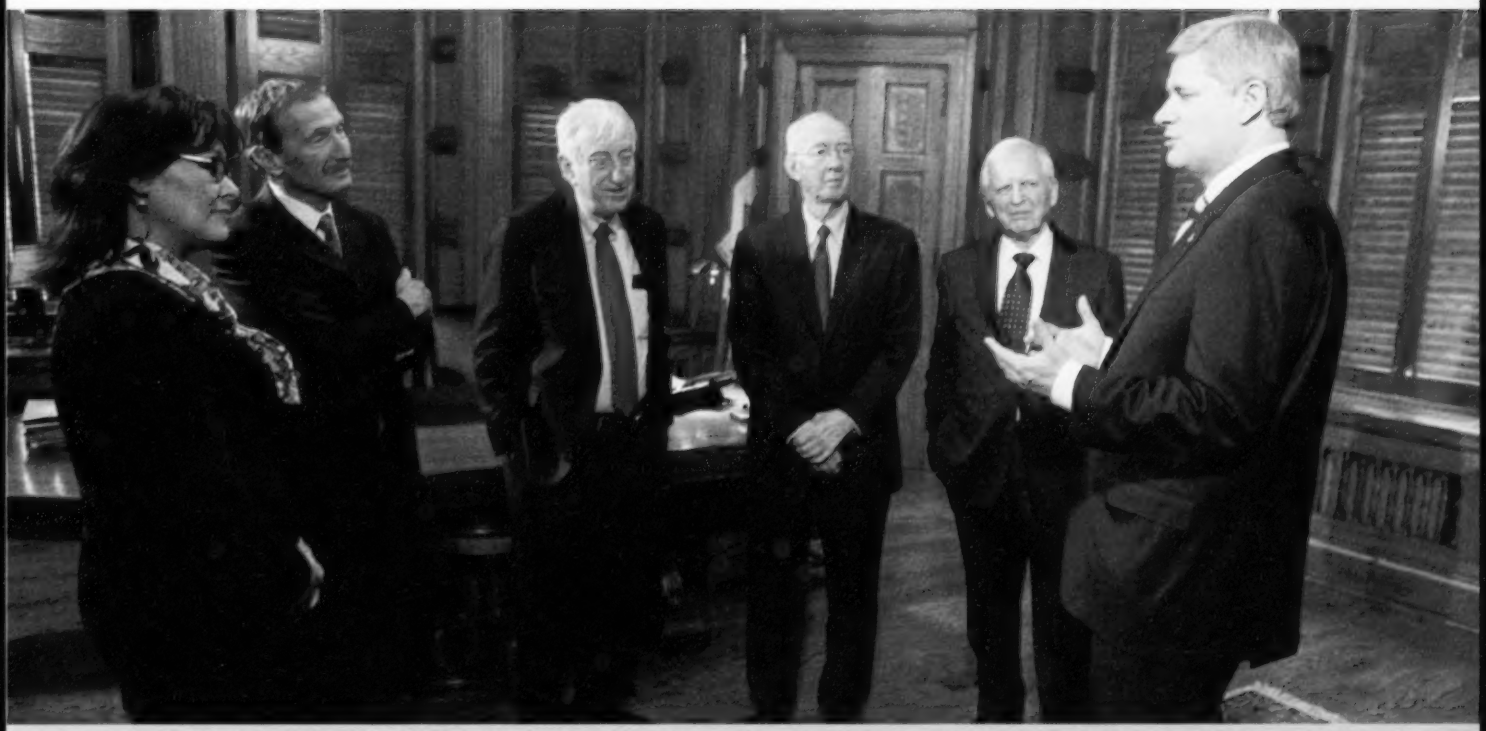
Responding to the H1N1 pandemic

CIHR participated in a number of initiatives in the fight against the H1N1 virus. Health Minister Leona Aglukkaq announced $10.8 million in funding for a national Influenza Research Network to strengthen Canada's capacity to evaluate the safety and effectiveness of a pandemic influenza vaccine and vaccination programs. The Network was created through a partnership between CIHR and the Public Health Agency of Canada and will link more than 80 scientists from 30 research and public health institutions. Health Minister Aglukkaq subsequently announced an additional $24 million in funding for the Network to support five research teams over the next two years.

Combating chronic disease around the globe

CIHR partnered with five other national health research councils to form the Global Alliance for Chronic Diseases initiative to collaborate in the critical battle against chronic, non-communicable diseases. At its inaugural scientific summit in New Delhi in November, the Alliance decided on three priorities: lowering hypertension (high blood pressure), reducing tobacco use and eliminating indoor pollution caused by crude cooking stoves in developing countries, which together contribute to about one in five deaths worldwide each year.

The Government of Canada announced that it is investing $30 million in a long-term study to increase our understanding of healthy aging.



Left to right: The Honourable Leona Aglukkaq, Dr. Rolf Zinkernagel, Dr. Peter Doherty, Dr. Bengt Samuelsson, Dr. Harald zur Hausen and the Right Honourable Stephen Harper

Celebrating the Gairdner Foundation's 50th anniversary

To help mark the 50th anniversary of the Gairdner Foundation, CIHR invited four distinguished health researchers, each a recipient of the Nobel Prize in Physiology or Medicine, to Ottawa: Dr. Bengt Samuelsson, Dr. Harald zur Hausen, Dr. Peter Doherty and Dr. Rolf Zinkernagel. During their visit, the Laureates delivered lectures at the University of Ottawa and Carleton University. The group received special recognition during Question Period in the House of Commons and met Prime Minister Stephen Harper before touring the Library of Parliament and attending a reception hosted by the Honourable Peter Milliken, Speaker of the House.

Improving our understanding of healthy aging

The Government of Canada announced that it is investing $30 million in a long-term study to increase our understanding of healthy aging. The Canadian Longitudinal Study on Aging, a 20-year research project funded in part by CIHR, will follow 50,000 Canadians between the ages of 45 and 85 at the time of recruitment. It will be the most comprehensive study on aging ever undertaken and will create a number of new highly qualified positions across the country. The study's organizers will be hiring as many as 160 researchers and research coordinators, laboratory staff and IT systems personnel over the next year at 10 centres across Canada.

CIHR recognized as one of Canada's top employers

In its annual survey of companies and organizations across the country, Mediacorp Canada Inc. named CIHR one of Canada's Top 100 Employers and one of the National Capital Region's Top 25 Employers. This award recognizes CIHR's commitment to providing a supportive and dynamic work environment for its employees.

"It's hugely beneficial to researchers to hear from some of the people they are trying to help, as opposed to research being done in an abstract way."

The Honourable Michael Kirby

Opening up the discussion on health research

CIHR's Café Scientifique program has continued to expand, successfully generating public discussion about the latest evidence in health research. In collaboration with the Mental Health Commission of Canada (MHCC), CIHR devoted a number of Cafés to the theme of mental health. Regarding the series, the Honourable Michael Kirby, Chair of the MHCC, said, "It's hugely beneficial to researchers to hear from some of the people they are trying to help, as opposed to research being done in an abstract way with no direct connection between the researcher and the person at the end of the line."

Canada joins international effort to provide access to health research

CIHR, the National Research Council's Canada Institute for Scientific and Technical Information and the US National Library of Medicine partnered to create PMC Canada, a free digital archive of peer-reviewed health science research. The PMC Canada search interface, launched in October 2009, allows users to browse, search and download articles. The long-term goal for PMC Canada is to create an international network of digital archives that will help researchers across the globe build upon one another's work and speed up the discovery process to address important health challenges.

Putting patients first in health research

In an effort to close the gap between basic discoveries and their application to the understanding, treatment and prevention of human disease, CIHR initiated consultations to create a shared vision for the new Strategy for Patient-Oriented Research. During the past fiscal year, CIHR held discussions with partners and stakeholders to determine the priorities for this strategy and the steps required to implement it.

Scaling up innovation in primary health care

CIHR brought together researchers, health-care professionals, administrators and policy makers at the Primary Health Care Summit in Toronto. This highly popular event – with over 450 participants – focused on effective practices in primary health-care delivery and strategies for transforming primary health care in Canada. Participants exchanged their knowledge and experiences in primary health-care delivery, research and knowledge translation.

Research Highlights 2009–10

Canadians decode breast cancer genome

In a world first, Canadian scientists revealed how breast cancer mutates as it evolves from a primary tumour to a metastasized state. CIHR-funded researchers **Drs. Samuel Aparicio** and **Marco Marra** of the **BC Cancer Agency** led the study, whose findings were published in *Nature*. By sequencing the genomes of tumour tissues donated by a woman at the beginning of her cancer and when it recurred nine years later, they showed the primary tumour was a mosaic of cells containing different mutations that then evolved. The discovery opens new doors to fight cancer, including personalized treatments targeting the genetic makeup of a patient's primary and metastatic tumours.

A way to overcoming the medical isotope crisis

Researchers at the **Centre hospitalier universitaire de Sherbrooke** and the **University of Sherbrooke**, in collaboration with **Advanced Cyclotron Systems Inc.** of Richmond, B.C., showed that Technetium-99m produced on a medical cyclotron is comparable to that derived from a nuclear reactor such as the aging Chalk River facility. The researchers, whose findings were reported in the *Journal of Nuclear Medicine*, concluded that networks of medium-energy cyclotrons could produce Technetium-99m to complement the supply of medical isotopes traditionally provided by nuclear reactors and sustain the expanding need for other medical isotopes. The team at the **Molecular Imaging Center of Sherbrooke** was led by **Drs. Brigitte Guérin** and **Johan E. van Lier**.

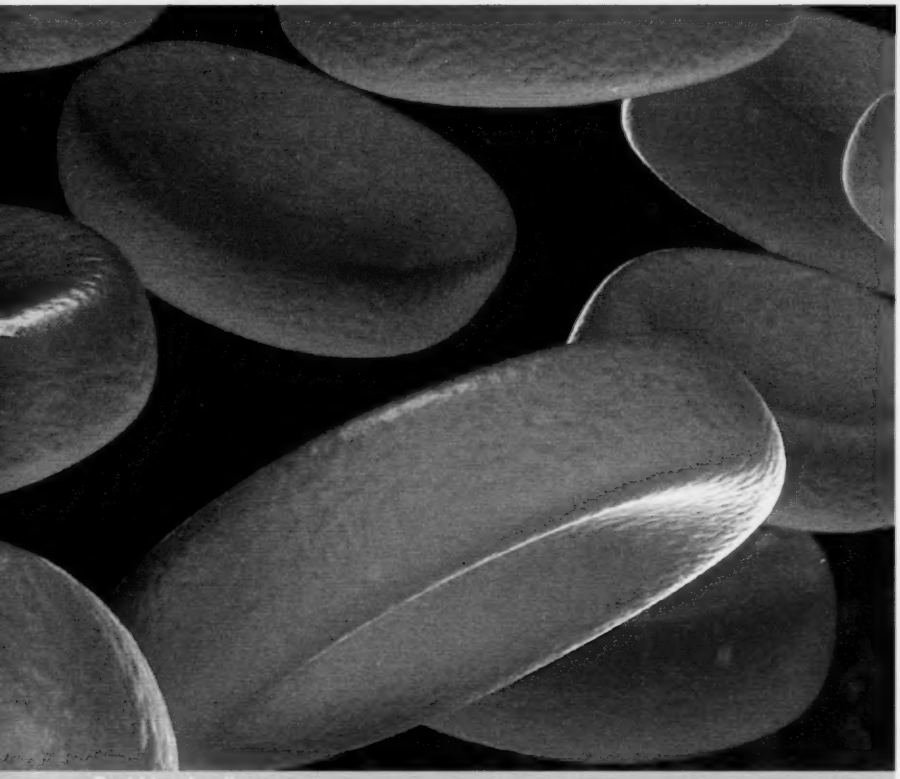
Can/Am team tracks how immune system battles herpes

A team of Canadian and American researchers discovered how the cold-sore causing Type 1 herpes simplex virus is identified and attacked by the body's immune system. **University of Montreal** researchers, working with **Washington University** and **Pennsylvania State University** scientists, found that the nuclear membrane of a cell in mice infected with the virus can indicate its presence and stimulate the immune system to go after it. **Dr. Michel Desjardins**, a Canada Research Chair in Cellular Microbiology, was senior author of the CIHR-supported study, which was published in *Nature Immunology*.

Antiviral offers hope to cancer patients

A common antiviral drug called ribavirin may help in treating cancer, according to a clinical trial led by **Dr. Katherine Borden** of the **Institute for Research in Immunology and Cancer**. The study, published in the journal *Blood*, found that patients with acute myeloid leukemia showed striking improvements – with partial or complete remissions – after they took ribavirin. The drug appears to inhibit the eIF4E gene, which malfunctions in 30% of cancers such as breast, prostate, colon and stomach cancer.

In a world first, Canadian scientists revealed how breast cancer mutates as it evolves from a primary tumour to a metastasized state.



Red blood cells

New blood: breakthrough could aid long-time diabetics

Dr. David Hess of the **University of Western Ontario** found a way to stimulate the growth of new blood vessels – a breakthrough that could one day help long-time diabetics who have peripheral artery disease because of reduced blood flow in their limbs. Using human bone marrow, Dr. Hess isolated three types of stem cells that work together to form new blood vessels. He purified them to eliminate contaminating cells and injected them into mice to improve blood flow and regenerate damaged leg capillaries. The results of the research, which was funded in part by CIHR, were published in the journal *Blood*.

Researchers advance the study of eye movement and FASD

CIHR funding enabled a **Queen's University** team led by **Dr. James Reynolds** to conduct a multicentre study to test the use of eye movement behaviours as a measure of brain function in children with Fetal Alcohol Spectrum Disorders (FASD). The researchers travelled to Ontario and Alberta communities to conduct the study, which combined the use of eye movement tasks and neuropsychological tests. Findings from the study, which also involved researchers at the **University of Alberta, St. Michael's Hospital** in Toronto and the **Children's Hospital of Eastern Ontario**, were published in the *European Journal of Neuroscience*.

Blood stem cell breakthrough by Montreal researchers

A team from the **Institute for Research in Immunology and Cancer** at **University of Montreal** succeeded in scaling up large quantities of stem cells from a small number of blood stem cells obtained from bone marrow. The multidisciplinary team, directed by CIHR-funded researcher **Dr. Guy Sauvageau**, published its findings in *Cell* in April 2009. The technique has been hailed as important in advancing the development of novel treatments for patients waiting for bone marrow transplants.

Doctoral student shows that women have 'classic' heart attack symptoms

Contrary to previous studies, new research results show that classic heart attack symptoms are equally common in men and women. **Dr. Martha Mackay**, a CIHR clinical research fellow who recently completed a PhD at the **University of British Columbia**, studied 305 patients undergoing angioplasty – a procedure to widen blood vessels that briefly produces symptoms similar to a heart attack. She found no gender differences in rates of chest discomfort or other typical symptoms. The results were presented at the Canadian Cardiovascular Congress.

Stroke breakthrough: cells live even if blood flow stops

A research team led by **Dr. Michael Tymianski**, a neurosurgeon at **Toronto Western Hospital**, found a way to suppress an ion channel called TRPM7 to

keep rats' brain cells alive when blood flow is interrupted. The findings, published in *Nature Neuroscience*, could help prevent the devastating effects caused by stroke – in which the brain is deprived of oxygen and nutrients and cells die. The study was supported by CIHR.

Drug combo spares wheezing infants from hospital stays

A CIHR-funded study led by **University of Ottawa's Dr. Amy Plint** found that a combined therapy of dexamethasone and epinephrine – previously used separately with no consistent benefit – significantly reduced hospital admissions for infants who arrived at emergency departments with a wheeze-inducing infection called bronchiolitis. Results from the study, which involved 800 babies in eight Canadian pediatric hospitals, were published in the *New England Journal of Medicine*.

Dendritic cells play key role in fighting *Listeria*

University of British Columbia (UBC) microbiologists and immunologists identified a key defence mechanism that the immune system uses against *Listeria*, the bacteria that can cause the food-borne infection listeriosis. The UBC team, led by **Dr. Wilfred Jefferies**, focused on dendritic cells that collect pathogen materials and present them to other parts of the immune system. Published in the online journal *PLoS ONE*, the CIHR-funded study could help researchers develop new strategies for treating bacterial infections and create vaccines against *Listeria*.

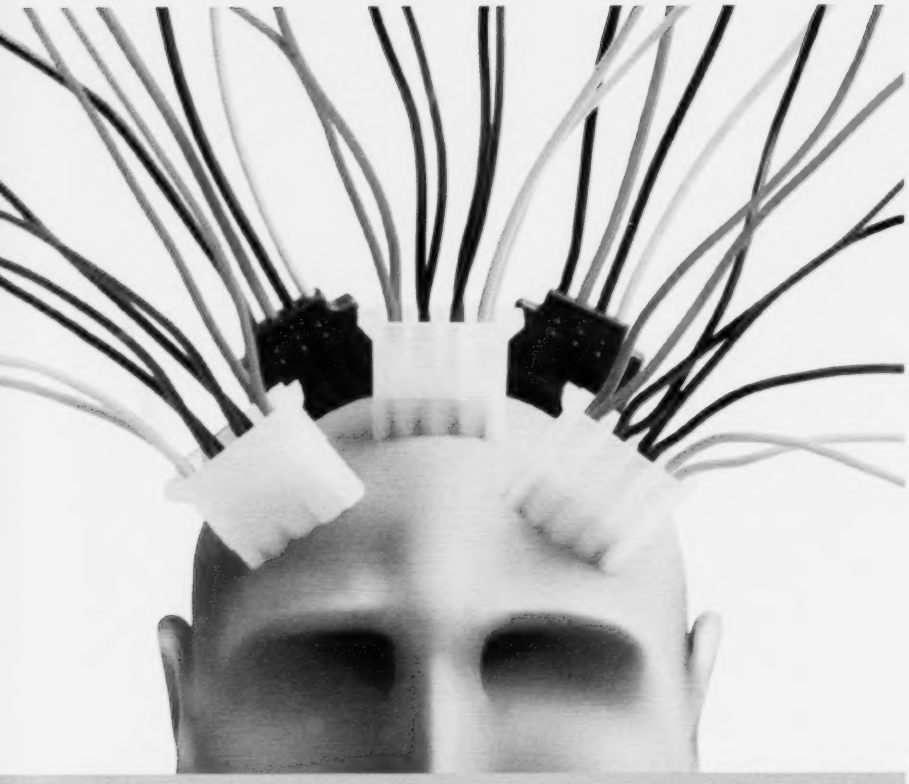
It's safe to delay interventions after mild heart attacks

A CIHR-funded study, led by **Dr. Shamir R. Mehta** of **McMaster University**, found that delayed angioplasty for most victims of threatened or mild heart attacks is as effective as immediate angioplasty for preventing heart attack, stroke or death. However, early angioplasty was found to be superior in the one-third of patients with higher risk features. Findings from the Canadian-led global randomized trial, published in the *New England Journal of Medicine*, have important implications for cardiac care and resource allocation.

Immune system could be manipulated to fight fat

A CIHR supported study discovered that T-lymphocytes have a critical role to play in killing fat cells and controlling insulin resistance in obesity associated with Type 2 diabetes and related syndromes. Based on research in mouse models and patient tissue, the discovery suggests the body's immune system can be manipulated to fight obesity and diabetes. The study, whose senior author was **Dr. Hans-Michael Dosch** of Toronto's **SickKids Hospital**, included researchers from the **University of Toronto, Mount Sinai Hospital** and **Stanford University** in California. Results were published in *Nature Medicine*.

A Canada/US research team found that a diabetes drug appears to make vaccines and cancer treatments more effective.



Stress can cause the brain to misread signals

Neurons in the hypothalamus – the part of the brain that produces hormones that react to stress and control body temperature, hunger, moods and sex drive – can misinterpret chemical "off" signals for "on" in response to acute stress. CIHR-supported researchers at the **University of Calgary** found that a protein known as KCC2 manages the process through which brain cells receive different chemical signals. Working with rats, the researchers discovered that stress affects KCC2 activity so that "off" becomes "on." Understanding how to reset this switch may hold the key to managing stress-related disorders. The study, led by **Dr. Jaideep Bains,** was published in *Nature Neuroscience*.

Diabetes drug could turbo-charge cancer therapies

A Canada/US research team found that a diabetes drug appears to make vaccines and cancer treatments more effective. The study, funded in part by CIHR, found that metformin, used to treat Type 2 diabetes, boosted the number of cancer-fighting T-cells in mice and left their immune systems better able to battle tumours. **McGill University's Dr. Russell Jones** co-authored the study with colleagues at the **University of Pennsylvania**. It was published in *Nature*.

Providing Stewardship and Accountability

CIHR Governing Council

CIHR reports to Parliament through the Minister of Health. Its Governing Council comprises 20 Canadians who have been appointed by Order in Council to renewable three-year terms. Council members represent a wide range of backgrounds and disciplines, reflecting CIHR's broad mandate and vision.

CIHR Institutes

CIHR is composed of 13 innovative Institutes. These Institutes bring together all partners in the research process – those who fund research, those who carry it out and those who use its results – to share ideas and focus on what Canadians need – good health and the means to prevent and fight diseases when they happen.

Each Institute is headed by a Scientific Director who is a leader in his or her field. Scientific Directors receive guidance from their Institute Advisory Boards, made up of volunteers from all areas of the health research community.

CIHR Executive Management Team

CIHR's Executive Management Team provides leadership and decision making for strategic, corporate policy and management areas that support and contribute to the strategic directions set out by the Governing Council.

Governing Council 2009–10

CIHR Governing Council members with the Honourable Leona Aglukkaq.
Left to right: P. J. McGrath, R. S. Sheldon, J. Brien, J. L. Rouleau, H. A. Steinberg, A. Beaudet, L. Aglukkaq, H. M. Chochinov, K. G. Anderson, B. Prigent, B. B. Finlay, K. Dodds. Missing: N. Letourneau, C. W. Loomis, R. Rajotte, J. Rossant, B. Thomlinson, C. Wieman

Dr. Alain Beaudet
(Chair)
President
Canadian Institutes of Health Research

Mr. Keith G. Anderson
Senior Policy Advisor and Health Management Consultant
British Columbia

Dr. James Brien
Professor of Pharmacology and Toxicology
Director of Research
Faculty of Health Sciences
Queen's University

Dr. Harvey Max Chochinov
Canada Research Chair in Palliative Care
Professor of Psychiatry
University of Manitoba and
CancerCare Manitoba

Dr. Brett B. Finlay
Professor
Michael Smith Laboratories
Department of Biochemistry and Molecular Biology
University of British Columbia

Dr. Nicole Letourneau
Professor
Faculty of Nursing
University of New Brunswick

Dr. Christopher W. Loomis
President and Vice-Chancellor *Pro Tempore*
Memorial University of Newfoundland

Dr. Patrick John McGrath
Vice-President Research
IWK Health Centre
Professor of Psychology, Pediatrics and Psychiatry
Dalhousie University

Dr. Bernard Prigent
Vice-President and Medical Director
Pfizer Canada
Montreal, Quebec

Dr. Ray Rajotte
Professor of Surgery and Medicine
Director
Surgical-Medical Research Institute
Director
Islet Transplantation Group
University of Alberta

Mr. Morris Rosenberg
(Ex-Officio)
Deputy Minister
Health Canada

Dr. Janet Rossant
Chief of Research
Hospital for Sick Children
Professor
Department of Medical Genetics and Microbiology
University of Toronto

Dr. Jean L. Rouleau
Dean of Medicine
University of Montreal

Dr. Robert S. Sheldon
(until October 2009)
Professor of Cardiac Sciences, Medicine and Medical Genetics
Associate Dean of Clinical Research
University of Calgary
Vice-President Research
Calgary Health Region

Mr. H. Arnold Steinberg
Vice-Chair
Principal
Cleman Ludmer Steinberg, Inc.
Director
McGill University Health Centre Foundation
MUHC Research Institute and Canadian Patient Safety Institute

Dr. Bill Thomlinson
(until December 2009)
Executive Director
Canadian Light Source Inc.
University of Saskatchewan

Dr. Cornelia Wieman
Co-Director
Indigenous Health Research Development Program
Assistant Professor
Dalla Lana School of Public Health
Faculty of Medicine
University of Toronto

CIHR Institutes

CIHR Institute of Aboriginal Peoples' Health (CIHR-IAPH)

CIHR-IAPH fosters the advancement of a national health research agenda to improve and promote the health of First Nations, Inuit and Métis peoples in Canada through research, knowledge translation and capacity building. The Institute's pursuit of research excellence is enhanced by respect for community research priorities and Indigenous knowledge, values and cultures.

Dr. Malcolm King
University of Alberta

CIHR Institute of Aging (CIHR-IA)

Adults over 65 years constitute the fastest growing age group in Canada. By the year 2026, one out of every four Canadians will be considered 'seniors', surpassing the number of children under the age of 15 in this country. CIHR-IA supports research in the field of aging to improve the health and quality of life of older Canadians by understanding and addressing or preventing the consequences of a wide range of factors associated with aging.

Dr. Anne Martin-Matthews
University of British Columbia

CIHR Institute of Cancer Research (CIHR-ICR)

CIHR ICR has been coordinating cancer research across Canada in priority areas such as palliative and end of life care, establishing a model for the world. Future priorities span the continuum of cancer and include prevention, individualized cancer care, cancer stem cells and survivorship, with research training and capacity building being an overarching priority.

Dr. Morag Park
McGill University

CIHR Institute of Circulatory and Respiratory Health (CIHR-ICRH)

Heart, lung and blood vessel diseases are the major health burdens facing Canadians – yet if we understood how our genes, the environment and our behaviour interplay to cause these common conditions, they might be preventable. CIHR-ICRH is supporting research that asks tough questions about the causes, consequences and control of these conditions.

Dr. Peter Liu
University Health Network
University of Toronto

CIHR Institute of Gender and Health (CIHR-IGH)

CIHR-IGH fosters research excellence regarding the influence of gender and sex on health, and applies these research findings to identify and address pressing health challenges. Gender and sex influence health in many ways that, if better understood, could inform interventions and programs designed to improve the health and well-being of women, men, boys and girls.

Dr. Joy Johnson
University of British Columbia

CIHR Institute of Genetics (CIHR-IG)

CIHR-IG supports research on the human and other genomes and on all aspects of genetics, basic biochemistry and cell biology. New advances in genetics and genomics, and in the understanding of how cells work, pose challenges to our health-care system and often raise complex ethical, legal and social issues. The Institute is addressing these challenges to develop solutions that benefit Canadians.

Dr. Roderick McInnes
Hospital for Sick Children
University of Toronto

CIHR Institute of Health Services and Policy Research (CIHR-IHSPR)

CIHR IHSPR is helping the country meet the challenge of making high-quality health care available to all those who need it, when and where they need it, while also ensuring that Canada's health care system is responsive, efficient and sustainable. It does so by supporting the brightest minds in health services and policy research, championing the development of the methods and tools that generate excellent research, and supporting evidence-informed health policy decision making.

Dr. Colleen M. Flood
University of Toronto

CIHR Institute of Human Development, Child and Youth Health (CIHR-IHDCYH)

CIHR-IHDCYH promotes and supports research that improves the health and development of mothers, infants, children, youth and families in Canada and throughout the world. Through our support, researchers address a wide range of health concerns, including those associated with reproduction, early development, childhood and adolescence.

Dr. Michael Kramer
Montreal Children's Hospital
McGill University

CIHR Institute of Infection and Immunity (CIHR-III)

CIHR-III led the charge against SARS and H1N1, orchestrating a rapid research response unprecedented in Canadian health research. Its strategic priorities are the immune system and infectious disease. Areas that fall under this umbrella include vaccine development, food and water safety and the federal government's initiatives in HIV/AIDS research.

Dr. Bhagirath Singh
(until December 2009)
University of Western Ontario

Dr. Marc Ouellette
(as of January 1, 2010)
Laval University

CIHR Institute of Musculoskeletal Health and Arthritis (CIHR-IMHA)

Move It or Lose It! Musculoskeletal (MSK) health, including muscle, joint and bone health, is dependent on optimal amounts of physical activity. MSK disorders such as osteoporosis and arthritis can limit mobility and ability to be physically active, creating a vicious circle of inactivity and MSK degeneration. CIHR-IMHA is working to better understand and treat MSK (including skin and oral) diseases and injury and to improve the health of Canadians by focusing on our flagship theme of physical activity.

Dr. Jane Aubin
University of Toronto

CIHR Institute of Neurosciences, Mental Health and Addiction (CIHR-INMHA)

From diseases of the central nervous system (e.g. Alzheimer's disease), to addiction, to mental ill health (e.g. schizophrenia) and to the five senses through which we interpret the world, CIHR-INMHA is concerned with how the brain works and with finding new ways to improve the outcomes of brain-related illnesses, which are recognized internationally as leading causes of life-long disability.

Dr. Anthony Phillips
University of British Columbia

CIHR Institute of Nutrition, Metabolism and Diabetes (CIHR-INMD)

CIHR-INMD supports research that addresses the causes, prevention, screening, diagnosis, treatment and palliation of a wide range of conditions associated with hormone, digestive system, kidney, and liver function. CIHR-INMD has identified four strategic priorities that will guide the Institute from 2010 to 2014: food and health; continuum of care; environments, genes and chronic disease; and seeking solutions to obesity.

Dr. Philip Sherman
University of Toronto

CIHR Institute of Population and Public Health (CIHR-IPPH)

CIHR-IPPH is supporting innovative research to understand the impacts of multi-level program and policy interventions on health improvements. This renewed focus requires researchers and other stakeholders to explore pathways to health equity so that all people can reach their full health potential regardless of gender, race or socioeconomic status.

Dr. Nancy Edwards
University of Ottawa

Executive Management Team

Dr. Alain Beaudet
President

Ms. Christine Fitzgerald
Executive Vice President

Dr. Ian Graham
Vice President, Knowledge Translation and Public Outreach

Dr. Pierre Chartrand
Chief Scientific Officer
Vice-President, Research

Mr. James Roberge
Chief Financial Officer
Vice-President, Resource Planning and Management

Financial Statement Discussion and Analysis

Disclaimer

This Financial Statement Discussion and Analysis (FSD&A) should be read in conjunction with the Canadian Institutes of Health Research (CIHR) annual audited financial statements for the year ended March 31, 2010 and accompanying notes. The FSD&A and audited financial statements have been reviewed and approved by the CIHR Governing Council. CIHR's financial statements have been prepared in accordance with Canadian generally accepted accounting principles for the public sector. During the current fiscal year, CIHR has adopted the revised Treasury Board Accounting Standard TBAS 1.2: Departmental and Agency Financial Statements, which has affected the method of presentation, but has had no significant impact on CIHR's financial results.

The numbers presented in the discussion below have been rounded to the nearest $100,000.

Financial Highlights

In 2009–10, CIHR used $983.7 million of parliamentary authorities, an increase of $14.3 million (or 1.5%) as compared to 2008–09 parliamentary authorities used of $969.4 million. The main contributing factor to this increase pertains to the temporary expanded funding for the Canada Graduate Scholarships (CGS) program, totalling $14.0 million in 2009–10 for CIHR. This additional funding for CGS was the first year of three yearly funding increases for this program as announced in Budget 2009. CIHR and the two other granting agencies, Natural Sciences and Engineering Research Council of Canada (NSERC) and the Social Sciences and Humanities Research Council (SSHRC), received a total of $87.5 million in funding for CGS over three years. This incremental CGS funding will enable CIHR to fund 200 new three-year Doctoral awards each year through 2011–12, and 400 new one-year Master's awards per year through 2010–11.

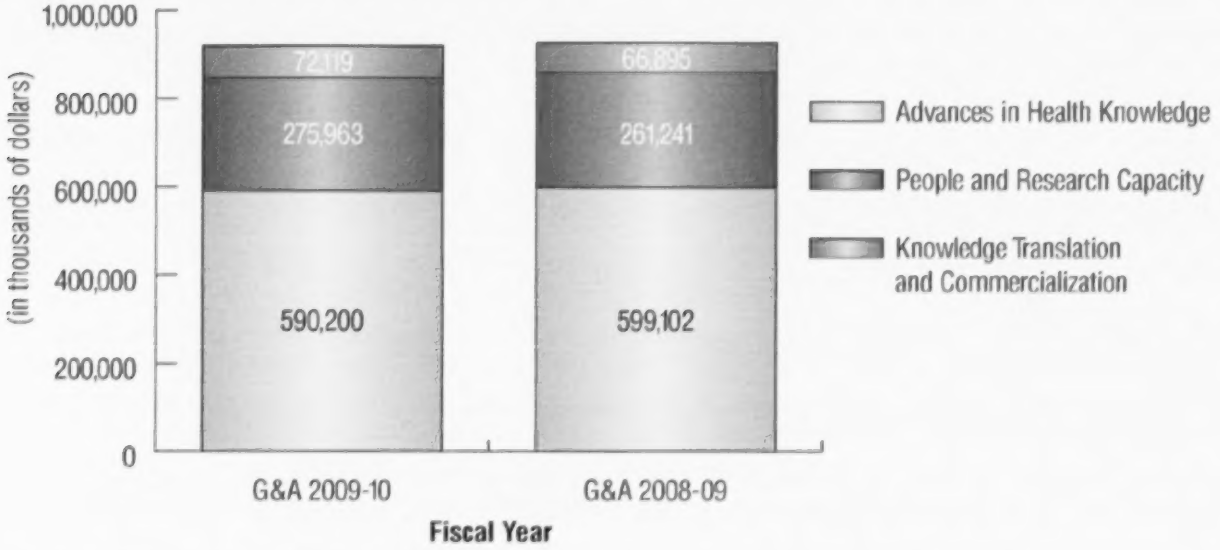
CIHR's total assets ($20.7 million) and total liabilities ($26.2 million) are both slightly higher than in 2008–09. The acquisition of tangible capital assets ($1.1 million) during the 2009–10 fiscal year is fairly consistent with the prior year, which, along with amounts owing from the Consolidated Revenue Fund (virtually unchanged since 2008–09), makes up the majority of CIHR's total assets. The majority of capital asset acquisitions pertain to the capitalization of ResearchNet development costs. ResearchNet is an internet research portal that supports collaboration and information sharing between researchers, research organizations, government, not-for-profit agencies, industry and the public in a secure environment. It is designed to provide the Canadian research community with an online "one-stop shop" to interact with funding agencies and to create significant efficiencies by making it simpler for researchers to apply for grants and rendering the CIHR peer-review process more efficient. CIHR's total liabilities increased by approximately 7.8% during the 2009–10 fiscal year due primarily to increased severance and vacation pay accruals resulting from higher employee salaries.

The 2009–10 net cost of operations for CIHR was $986.0 million, an increase of 1.4% (or $13.2 million) as compared to 2008–09. This is mainly caused by an increase in grants and awards expenses, as well as an increase in salaries and employee benefits. The overall rise in the 2009–10 costs which have been incurred were as expected due to the additional funding programs approved in prior year budgets, including increased support for the Canada Graduate Scholarships Program, the launch of both the Drug Safety and Effectiveness Network and the Business-Led Networks of Centres of Excellence.

The following graphic indicates how 2009–10 grants and awards expenses were allocated by CIHR's three strategic outcomes. CIHR's three strategic outcomes are: (1) Advances in Health Knowledge, achieved by funding excellent and ethical health research across all disciplines that are relevant to health; (2) People and Research Capacity, achieved by providing funding to develop and sustain health researchers in vibrant, innovative and stable research environments, and (3) Knowledge Translation and Commercialization, achieved by CIHR's knowledge translation activities and funding aimed to accelerate the transformation of research results into health benefits for Canadians and an improved health-care system, as well as helping to move new research breakthroughs toward potential commercial applications.

As displayed in the graphic below, Advances in Health Knowledge expenses decreased slightly in 2009–10 due primarily to the sunsetting of the Canadian Fabry Disease Initiative Study, a study conducted to gather additional information regarding the use of enzyme replacement therapies to treat patients suffering from Fabry Disease. Please also note that People and Research Capacity expenses increased in 2009–10 as a result of the $140 million temporary increase for the Canada Graduate Scholarships program announced in Budget 2009.

Grants and Awards by Strategic Outcome



*Figures do not include refunds of previous years' expenses.

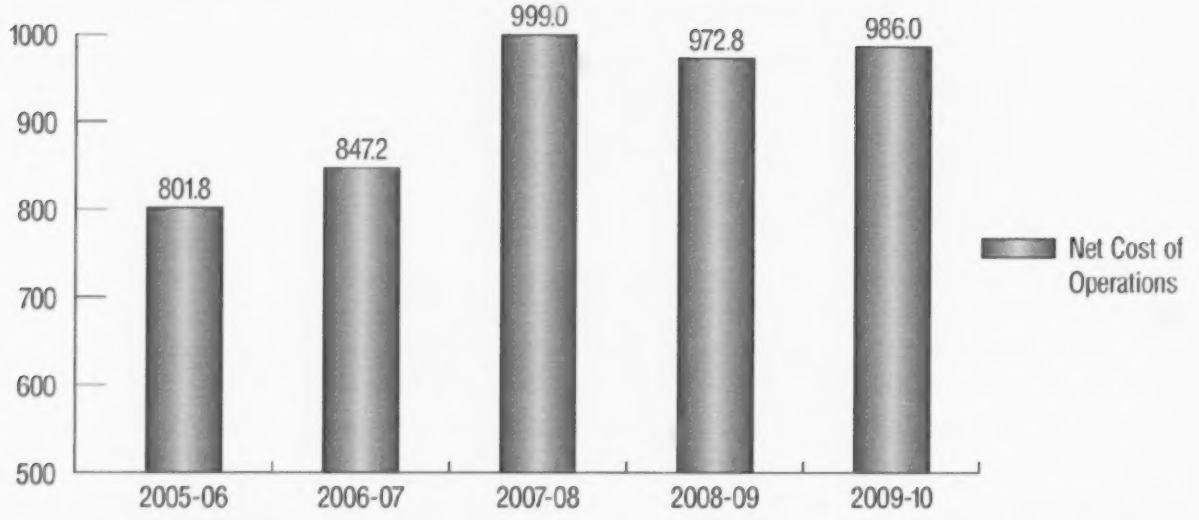
Variance Analysis and Discussion

CIHR's 2009–10 grants and awards expenses were $938.3 million, an increase of 1.2% as compared to 2008–09. The main contributing factor to this increase is directly related to the additional funding CIHR received as a result of Budget 2009 for the Canada Graduate Scholarships program, which supports Canada's top graduate students, and helps to ensure a reliable supply of highly skilled personnel to meet the needs of Canada's knowledge economy. As discussed above, the Government of Canada, through the three federal granting councils, has provided an additional $87.5 million over three fiscal years (ending in 2011–12) in order to provide additional Canada Graduate Scholars with the support to pursue their career goals. Additionally, CIHR's reference levels with regards to other grants and awards programs have remained fairly consistent with the prior year.

Furthermore, CIHR's operating expenses have also increased by $3.5 million (or 59%) as compared to 2008–09. The majority of this increase is directly related to employee salaries and benefits, as CIHR has increased its human resource capacity in order to effectively administer its suite of grants and awards programs, including its expanded CGS program. Overall, both the grants and awards expenses and the operating expenses have increased as expected due to the additional parliamentary authorities provided to CIHR during 2009–10, thus explaining the rise in net cost of operations from $972.8 million in 2008–09 to $986.0 million in 2009–10.

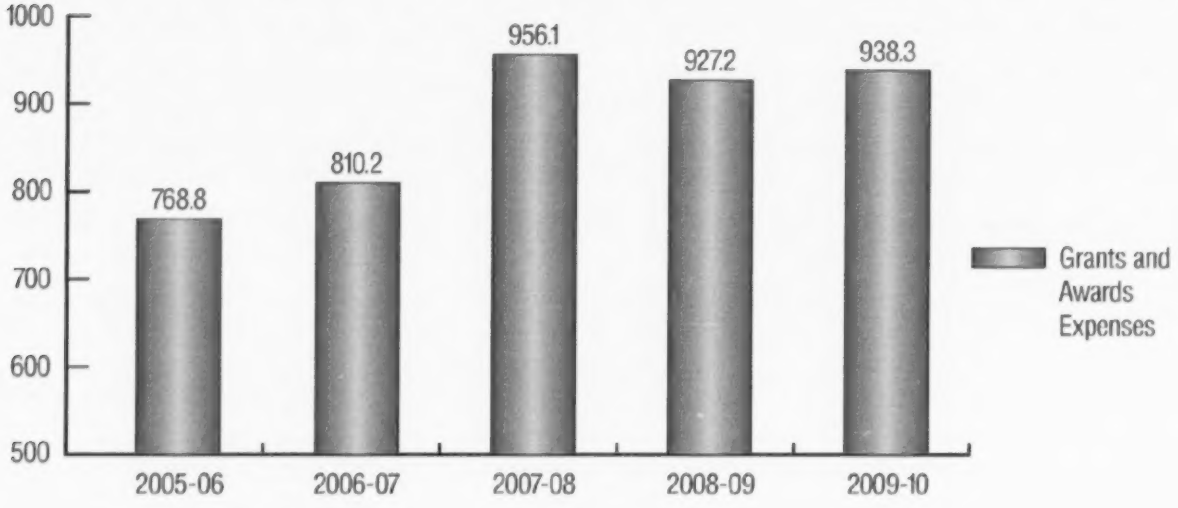
Trend Analysis

CIHR Net Cost of Operations (in millions of dollars)



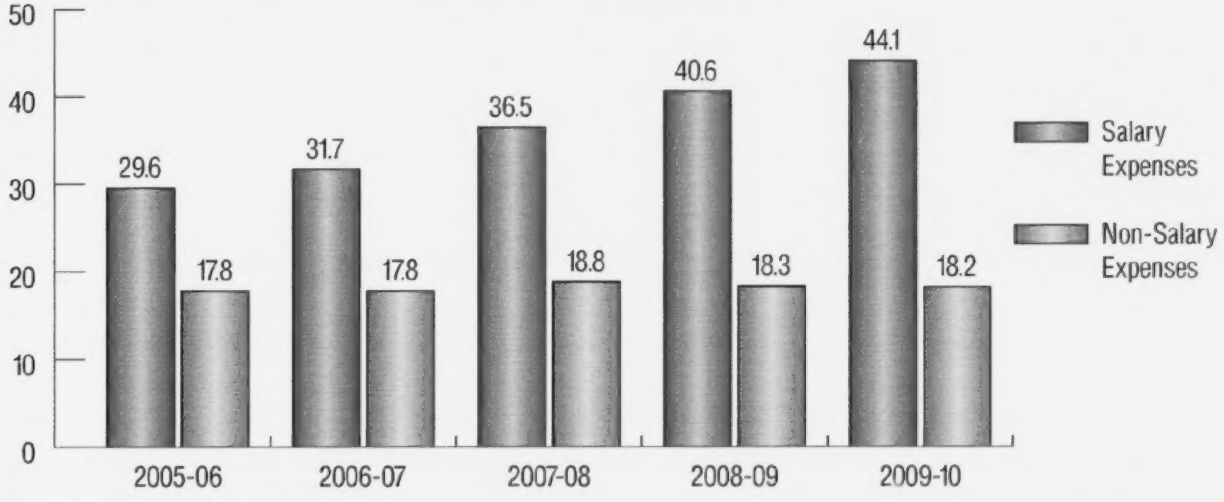
- CIHR net cost of operations increased to $986.0 million, an increase of $13.2 million (or 1.4%) as compared to 2008–09. This increase resulted from the aforementioned increase in CIHR parliamentary authorities for 2009–10 related to programs such as the CGS program.
- CIHR's net cost of operations has increased significantly over the past number of years, from $801.8 million in 2005–06 to $986.0 million in 2009–10. This increase of $184.2 (or 23.0%) is consistent with the steady growth in parliamentary authorities, with the focus of adding new strategic programs.

CIHR Grants and Awards Expenses (in millions of dollars)



- CIHR grants and awards expenses increased by $11.1 million (or 1.2%) in 2009–10 and by $169.5 (or 22.0%) since 2005–06 due to increased parliamentary authorities received by CIHR for its expanding suite of grants and awards programs.
- CIHR grants and awards expenses have increased by 22.0% since 2005–06, an average yearly increase of approximately 5.4%. The main contributing factor for this significant increase is that CIHR has commenced the funding of several new grants and awards programs during the past five years, including initiatives such as Pandemic Preparedness, Drug Safety and Effectiveness Network, and the Vanier Canada Graduate Scholarships.

CIHR Operations and Administration Expenses (in millions of dollars)



- In 2009–10, salaries and employee benefits made up 70.8% of total operating expenses, compared to 68.9% in 2008–09. The increase in CIHR's salaries and benefits and other operating expenses is consistent with the overall increase in grants and awards expenses.
- CIHR operating expenses have increased by 31.4% during the past few fiscal years, from $47.4 million in 2005–06 to $62.3 million in 2009–10. The steady growth in these expenses has mirrored the increase in total authorities, as well as the increase in grant and awards expenses.
- As shown in the chart above, the proportion of the operating budget allocated to salaries and employee benefits has increased each year over the past five fiscal years.

Risks

CIHR understands the importance of risk management and is committed to ensuring that risk management considerations are integrated into its strategic and operational planning, business processes and decision-making. In 2009–10, Governing Council approved the Risk Management Framework that sets out how CIHR identifies, assesses and mitigates risk. The Framework also provides a governance model that promotes accountability for risk management.

Health Research Roadmap

CIHR's new Strategic Plan, the *Health Research Roadmap*, sets out an ambitious agenda that will enable the agency to realize its full mandate in all its complexity, show leadership within the wider health research community and demonstrate accountability and results to the people of Canada. The Plan is not without risk, and sound risk management will play a critical role in whether CIHR will be successful in meeting its goals. A number of risks have been identified related to the implementation of the *Health Research Roadmap*, however, CIHR has taken the necessary steps to ensure that it is ready to mitigate and manage these risks throughout the Plan's implementation. Examples of such risks are listed below:

- The risk that key stakeholders, including students and researchers, universities and other research institutions, and other funders of health research such as other governmental organizations, charities and the private sector, do not understand or support the Plan. This risk will be mitigated by actively communicating and consulting with all affected parties. CIHR will need to demonstrate flexibility, adjusting the Plan as required to better respond to new developments and the evolving needs and priorities of others.

- The Plan is contingent on the successful implementation of a number of key reforms including: how peer review is conducted; establishing a fully integrated suite of open programs that can support excellence in all pillars and across all stages of a researcher's career; and a new, focused approach for ensuring that strategic investments address specific health research and system priorities. Individually and collectively, these reforms pose significant challenges and risk. Interdependencies among the reforms mean that they must be implemented concurrently. Staff will have to maintain existing systems/processes during the development period and manage a phased transition from old to new. The project management resources, expertise and experience to manage an implementation of this scale and complexity are limited and must compete with other activities such as the International Review Panel for staff time.

- Additionally, the Plan is creating high expectations within the health research community as well as for CIHR's partners. CIHR firmly believes that it must be accountable for implementing the Plan and transparent regarding its impacts. To ensure that the *Health Research Roadmap* truly guides CIHR's activities, annual implementation plans will be published that will detail how the strategic directions have been addressed to date by highlighting uptake, progress and completion of identified activities as well as activities planned for the next fiscal year.

Rising Demand for Research Funding

CIHR continues to be confronted with increased application pressure from the health research community resulting in part from a robust and growing community of practitioners, CIHR's mandate to serve all health research disciplines and by the significant investments in health-related infrastructure being made by federal and provincial governments and other funders.

Notwithstanding the more than doubling of CIHR's budget since its inception in 2000, the percentage of successful grant and award applicants in major competitions has fallen at a time when the number of applications that are assessed by peer review committees as being deserving of funding has tripled over that same timeframe.

Going forward, it will be very important for CIHR to rigorously prioritize its activities and seek additional parliamentary authorities to ensure that Canada continues to retain its outstanding investigators and fully reap the contribution they can make to improving the health of Canadians, increasing the effectiveness of health services and products and strengthening the Canadian health-care system.

Future Financial Outlook: 2010–2011

CIHR's foreseeable future is expected to continue to remain in good financial position as it continues to grow through its increased authorities approved by Parliament. CIHR anticipates its parliamentary authorities in 2010–11 to exceed $1 billon for the first time since its inception. It is expected that CIHR's total authorities will increase by $18.3 million (1.9%) as compared to 2009–10, from $987.8 million to approximately $1.006 billion in 2010–11. Future growth opportunities will present themselves through Budget 2010 via an ongoing annual increase to CIHR's base budget by $16.0 million, an additional $10.0 million over two years for the Isotope Supply Initiative to support research, development and demonstration of new technologies, to optimize the use of medical isotopes and alternative medical imaging technologies, and to establish a clinical trials network, $45.0 million over five years allocated among the three federal granting councils to establish a new and prestigious post-doctoral fellowships program, as well as $15.0 million per year to be shared between CIHR, NSERC and SSHRC that will help support additional collaborative projects in community colleges across Canada.

Auditor's Report and Financial Statements

Canadian Institutes of Health Research
MANAGEMENT RESPONSIBILITY FOR FINANCIAL STATEMENTS

Responsibility for the integrity and objectivity of the accompanying financial statements for the year ended March 31, 2010, and all information contained in these statements rests with the management of the Canadian Institutes of Health Research (CIHR). These financial statements have been prepared by management in accordance with Treasury Board accounting policies, which are based on Canadian generally accepted accounting principles for the public sector.

Management is responsible for the integrity and objectivity of the information in these financial statements. Some of the information in the financial statements is based on management's best estimates and judgment, and gives due consideration to materiality. To fulfill its accounting and reporting responsibilities, management maintains a set of accounts that provides a centralized record of CIHR's financial transactions. Financial information submitted in the preparation of the *Public Accounts of Canada*, and included in CIHR's *Departmental Performance Report*, is consistent with these financial statements.

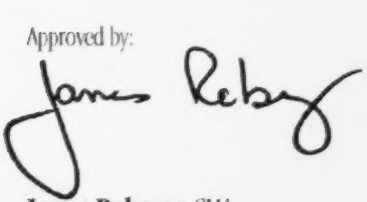
Management is also responsible for maintaining an effective system of internal control over financial reporting designed to provide reasonable assurance that financial information is reliable, that assets are safeguarded and that transactions are properly authorized and recorded in accordance with the *Financial Administration Act* and other applicable legislation, regulations, authorities and policies.

Management seeks to ensure the objectivity and integrity of data in its financial statements through careful selection, training, and development of qualified staff; through organizational arrangements that provide appropriate divisions of responsibility; through communication programs aimed at ensuring that regulations, policies, standards, and managerial authorities are understood throughout CIHR.

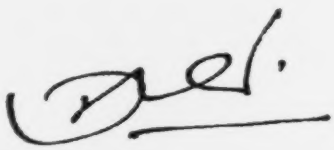
The CIHR Audit Committee, selected jointly by the President and the Comptroller General and appointed by the Treasury Board, provides independent, objective advice, guidance, and assurance on the adequacy of the CIHR control and accountability processes. In accordance with the Treasury Board Directive on Departmental Audit Committees, the Audit Committee has reviewed the financial statements with management and external auditors and discussed any significant issues and findings from the audit prior to recommending acceptance of the financial statements to the President and Governing Council.

The Auditor General of Canada, the independent auditor for the Government of Canada, has expressed an opinion on the fair presentation of the financial statements of CIHR.

Approved by:



James Roberge, CMA
Chief Financial Officer



Alain Beaudet, MD, PhD
President

Ottawa, Canada
June 2, 2010

Auditor General of Canada
Vérificatrice générale du Canada

AUDITOR'S REPORT

To the Canadian Institutes of Health Research
and the Minister of Health

I have audited the statement of financial position of the Canadian Institutes of Health Research as at March 31, 2010 and the statements of operations, equity of Canada and cash flow for the year then ended. These financial statements are the responsibility of the Canadian Institutes of Health Research's management. My responsibility is to express an opinion on these financial statements based on my audit.

I conducted my audit in accordance with Canadian generally accepted auditing standards. Those standards require that I plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In my opinion, these financial statements present fairly, in all material respects, the financial position of the Canadian Institutes of Health Research as at March 31, 2010 and the results of its operations and its cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.

Clyde M. MacLellan, CA
Assistant Auditor General
for the Auditor General of Canada

Ottawa, Canada
June 2, 2010

Canadian Institutes of Health Research
Statement of Financial Position
As at March 31
(in thousands of dollars)

	2010	2009
ASSETS		
Financial assets		
Due from the Consolidated Revenue Fund	$ 15,706	$ 15,612
Accounts receivable and advances (note 4)	691	624
Total financial assets	**16,397**	**16,236**
Non-financial assets		
Prepaid expenses	246	150
Tangible capital assets (note 5)	4,008	3,753
Total non-financial assets	**4,254**	**3,903**
	$ 20,651	**$ 20,139**
LIABILITIES AND EQUITY OF CANADA		
Liabilities		
Accounts payable and accrued liabilities (note 6)	$ 5,401	$ 5,462
Vacation pay and compensatory leave	1,475	1,123
Deferred revenue (note 7)	10,314	10,151
Employee future benefits (note 8)	9,027	7,591
	26,217	**24,327**
Equity of Canada	**(5,566)**	**(4,188)**
	$ 20,651	**$ 20,139**

Contingent liabilities (note 9)
Contractual obligations (note 10)

The accompanying notes are an integral part of these financial statements.

Approved by Governing Council:

Alain Beaudet, MD, PhD
President

Approved by Management:

James Roberge, CMA
Chief Financial Officer

Canadian Institutes of Health Research
Statement of Operations
For the Year Ended March 31
(in thousands of dollars)

	2010	2009
Expenses		
Advances in health knowledge	$ 625,991	$ 635,264
People and research capacity	292,699	277,009
Knowledge translation and commercialization	76,493	70,932
Total expenses	**995,183**	**983,205**
Revenues		
Advances in health knowledge	5,749	6,697
People and research capacity	2,688	2,920
Knowledge translation and commercialization	703	748
Total revenues	**9,140**	**10,365**
Net cost of operations	**$986,043**	**$972,840**

Segmented information (note 12)

The accompanying notes are an integral part of these financial statements.

Canadian Institutes of Health Research
Statement of Equity of Canada
For the Year Ended March 31
(in thousands of dollars)

	2010	2009
Equity of Canada, beginning of year	$ (4,188)	$ (3,715)
Net cost of operations	(986,043)	(972,840)
Net cash provided by Government	978,023	986,771
Change in Due from the Consolidated Revenue Fund	94	(20,759)
Services provided without charge by other government departments (note 11)	6,548	6,355
Equity of Canada, end of year	**$ (5,566)**	**$ (4,188)**

The accompanying notes are an integral part of these financial statements.

Canadian Institutes of Health Research
Statement of Cash Flows
For the Year Ended March 31
(in thousands of dollars)

	2010	2009
Operating activities		
Net cost of operations	$ 986,043	$ 972,840
Non-cash items:		
Amortization of tangible capital assets	(804)	(696)
Services provided without charge by other government departments (note 11)	(6,548)	(6,355)
Variations in Statement of Financial Position:		
Increase (decrease) in accounts receivable and advances	67	(333)
Increase in prepaid expenses	96	68
Decrease in accounts payable and accrued liabilities	61	18,897
(Increase) decrease in vacation pay and compensatory leave	(352)	193
(Increase) decrease in deferred revenue	(163)	1,860
(Increase) in future employee benefits	(1,436)	(1,018)
Cash used in operating activities	**976,964**	**985,456**
Capital investing activities		
Acquisitions of tangible capital assets	1,059	1,315
Cash used in capital investing activities	**1,059**	**1,315**
Net cash provided by Government of Canada	**$ 978,023**	**$ 986,771**

The accompanying notes are an integral part of these financial statements.

NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED MARCH 31, 2010

Canadian Institutes of Health Research

1. Authority and Objectives

The Canadian Institutes of Health Research (CIHR) was established in June 2000 under the *Canadian Institutes of Health Research Act*, replacing the former Medical Research Council of Canada. It is listed in Schedule II to the *Financial Administration Act* as a departmental corporation.

CIHR's objective is to excel, according to international standards of scientific excellence, in the creation of new knowledge, and its translation into improved health, more effective health services and products, and a strengthened Canadian health-care system. CIHR achieves these objectives through three strategic outcomes. The first strategic outcome is advances in health knowledge, achieved by funding excellent and ethical health research across all disciplines that are relevant to health. The second strategic outcome is people and research capacity, achieved by providing funding to develop and sustain health researchers in vibrant, innovative and stable research environments. The third strategic outcome is knowledge translation and commercialization, achieved by CIHR's knowledge translation activities and funding aimed to accelerate the transformation of research results into health benefits for Canadians and an improved health care system as well as helping to move new research breakthroughs toward potential commercial applications.

CIHR is led by a President who is the Chairperson of a Governing Council of not more than nineteen other members appointed by the Governor in Council. The Governing Council sets overall strategic direction, goals and policies and oversees programming, resource allocation, ethics, finances, planning and accountability.

CIHR has thirteen Institutes that focus on identifying the research needs and priorities for specific health areas, or for specific populations, then developing strategic initiatives to address those needs. Each Institute is led by a Scientific Director who is guided by an Institute Advisory Board, which strives to include representation of the public, researcher communities, research funders, health professionals, health policy specialists and other users of research results.

CIHR's grants, awards, and operating expenditures are funded by budgetary authorities. Employee benefits are funded by statutory authorities.

2. Significant Accounting Policies

These financial statements have been prepared in accordance with Treasury Board accounting policies stated below, which are based on Canadian generally accepted accounting principles for the public sector. The presentation and results using the stated accounting policies do not result in any significant differences from Canadian generally accepted accounting principles.

Significant accounting policies are as follows:

(a) Parliamentary authorities – CIHR is financed by the Government of Canada through Parliamentary authorities. Financial reporting of authorities provided to CIHR does not parallel financial reporting according to generally accepted accounting principles since authorities are primarily based on cash flow requirements. Consequently, items recognized in the Statement of Operations and the Statement of Financial Position are not necessarily the same as those provided through authorities from Parliament. Note 3 provides a reconciliation between the bases of reporting.

(b) Net cash provided by Government – CIHR operates within the Consolidated Revenue Fund (CRF), which is administered by the Receiver General for Canada. All cash received by CIHR is deposited to the CRF and all cash disbursements made by CIHR are paid from the CRF. The net cash provided by Government is the difference between all cash receipts and all cash disbursements including transactions between departments of the Government.

(c) Amounts due from the CRF are the result of timing differences at year end between when a transaction affects authorities and when it is processed through the CRF. Amounts due from the CRF represent the amount of cash that CIHR is entitled to draw from the CRF without further appropriations to discharge its liabilities.

(d) Revenues

- Funds received from external parties for specified purposes are recorded upon receipt as deferred revenues. These revenues are recognized in the period in which the related expenses are incurred.

- Funds that have been received are recorded as deferred revenue, provided CIHR has an obligation to other parties for the provision of goods, services, or the use of assets in the future.

- Other revenues are accounted for in the period in which the underlying transaction or event that gave rise to the revenue takes place.

(e) Expenses – Expenses are recorded on the accrual basis:

- Grants and awards are recognized in the year in which the conditions for payment are met. In the case of grants which do not form part of an existing program, the expense is recognized when the Government announces a decision to make a non-recurring transfer, provided the enabling legislation or authorization for payment receives parliamentary approval prior to the completion of the financial statements.

- Vacation pay and compensatory leave are accrued as the benefits are earned by employees under their respective terms of employment.

- Services provided without charge by other government departments for accommodation, employer contributions to the health and dental insurance plans, and audit services are recorded as operating expenses at their estimated cost.

(f) Refunds of previous years' expenses – These amounts include the return of grants and awards funds to CIHR in the current fiscal year for expenses incurred in previous fiscal years due to cancellations; refunds of previous years' expenses related to goods or services; and adjustments of previous years' accounts payable. These refunds and adjustments are recorded against the related expenses in the financial statements but are recorded as revenue on an authority basis and therefore are excluded when determining current year authorities used.

(g) Employee future benefits

i. Pension benefits: Eligible employees participate in the Public Service Pension Plan, a multiemployer defined benefit plan administered by the Government. CIHR's contributions to the Plan are charged to expenses in the year incurred and represent the total obligation of CIHR to the Plan. Current legislation does not require CIHR to make contributions for any actuarial deficiencies of the Plan.

ii. Severance benefits: Employees are entitled to severance benefits under labour contracts or conditions of employment. These benefits are accrued as employees render the services necessary to earn them. The obligation relating to the benefits earned by employees is calculated using information derived from the results of the actuarially determined liability for employee severance benefits for the Government as a whole.

(h) Accounts receivable and advances are stated at the lower of cost and net recoverable value; a valuation allowance is recorded for receivables where recovery is considered uncertain.

(i) Contingent liabilities – Contingent liabilities are potential liabilities which may become actual liabilities when one or more future events occur or fail to occur. To the extent that the future event is likely to occur or fail to occur, and a reasonable estimate of the loss can be made, an estimated liability is accrued and an expense is recorded. If the likelihood is not determinable or an amount cannot be reasonably estimated, the contingency is disclosed in the notes to the financial statements.

(j) Tangible capital assets – All tangible capital assets having an individual initial cost of $5000 or more are recorded at their acquisition cost. CIHR does not capitalize intangibles, works of art and historical treasures that have cultural, aesthetic or historical value, assets located on Indian Reserves and museum collections.

Amortization of tangible capital assets is done on a straight line basis over the estimated useful life of the capital asset as follows:

Asset class	Amortization period
Informatics hardware	3–5 years
Informatics software	3–10 years
Office equipment	10 years
Vehicles	5 years

Assets under construction are recorded in the applicable capital asset class in the year that they become available for use and are not amortized until they become available for use.

(k) Measurement uncertainty – The preparation of these financial statements requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses reported in the financial statements. At the time of preparation of these statements, management believes the estimates and assumptions to be reasonable. The most significant items where estimates are used are contingent liabilities, the liability for vacation pay and compensatory leave, employee severance benefits, the useful life of tangible capital assets, and services provided without charge. Actual results could significantly differ from those estimated. Management's estimates are reviewed periodically and, as adjustments become necessary, they are recorded in the financial statements in the year they become known.

3. Parliamentary Authorities

CIHR receives most of its funding through annual Parliamentary authorities. Items recognized in the Statement of Operations and the Statement of Financial Position in one year may be funded through parliamentary authorities in prior, current or future years. Accordingly, CIHR has different net results of operations for the year on a government funding basis than on an accrual accounting basis. The differences are reconciled in the following tables:

(a) Reconciliation of net cost of operations to current year authorities used

(in thousands of dollars)

	2010	2009
Net cost of operations	**$ 986,043**	**$ 972,840**
Adjustments for items affecting net cost of operations but not affecting authorities:		
Services provided without charge	(6,548)	(6,355)
Refunds of previous years' expenses	5,434	2,901
Increase in employee severance benefits	(1,436)	(1,018)
Amortization of tangible capital assets	(804)	(696)
Increase in vacation pay and compensatory leave	(352)	193
Other adjustments	242	168
	(3,464)	(4,807)
Adjustments for items not affecting net cost of operations but affecting authorities:		
Acquisitions of tangible capital assets	1,059	1,315
Increase in prepaid expenses	96	68
	1,155	1,383
Current year authorities used	**$ 983,734**	**$ 969,416**

(b) Authorities provided and used

(in thousands of dollars)

	2010	2009
Authorities provided:		
Vote 20 - Operating expenditures	$ 52,698	$ 51,032
Vote 25 - Grants	929,327	917,670
Statutory amounts	5,745	5,302
Less:		
Authorities available for future years	(2,162)	(2,145)
Lapsed: Operating	(1,692)	(1,649)
Lapsed: Grants	(182)	(794)
Current year authorities used	**$ 983,734**	**$ 969,416**

4. Accounts Receivable and Advances

The following table presents details of CIHR's accounts receivable and advances balances:

(in thousands of dollars)

	2010	2009
Receivables from other government departments and agencies	$ 220	$ 216
Receivables from external parties	310	287
Employee advances	186	190
	716	693
Allowance for doubtful accounts on receivables from external parties	(25)	(69)
	$ 691	**$ 624**

5. Tangible Capital Assets

(in thousands of dollars)

	Cost				Accumulated Amortization				Net Book Value	
Capital asset class	Opening balance	Acquisitions	Disposals and write-offs	Closing balance	Opening balance	Amortization	Disposals and write-offs	Closing balance	2010	2009
Informatics hardware	2,561	137	-	2,698	1,874	191	-	2,065	633	687
Informatics software	9,526	860	-	10,386	6,688	568	-	7,256	3,130	2,838
Office equipment	402	62	-	464	192	40	-	232	232	210
Vehicles	32	-	-	32	14	5	-	19	13	18
Total	**$12,521**	**$1,059**	-	**$13,580**	**$8,768**	**$804**	-	**$9,572**	**$4,008**	**$3,753**

Amortization expense (in thousands of dollars) for the year ended March 31, 2010, is $804 (2009 - $696).

6. Accounts Payable and Accrued Liabilities

The following table presents details of CIHR's accounts payable and accrued liabilities:

(in thousands of dollars)

	2010	2009
Accounts payable to other government departments and agencies	$ 1,928	$ 1,460
Accounts payable to external parties	2,174	1,879
	4,102	3,339
Accrued liabilities	1,299	2,123
	$ 5,401	**$ 5,462**

7. Deferred Revenue

Deferred revenue represents the balance at year end of unearned revenues stemming from amounts received from external parties which are restricted to fund the expenditures related to specific research projects and amounts received for fees prior to services being performed. Revenue is recognized in the period that these expenditures are incurred or the service is performed. Details of the transactions related to this account are as follows:

(in thousands of dollars)

	2010	2009
Opening balance	$ 10,151	$ 12,011
Amounts received	9,301	8,353
Revenue recognized	(9,138)	(10,213)
Closing balance	**$ 10,314**	**$ 10,151**

8. Employee Future Benefits

Employees of CIHR are entitled to specific benefits on or after termination or retirement, as provided for under various collective agreements or conditions of employment.

(a) Pension benefits: CIHR's employees participate in the Public Service Pension Plan, which is sponsored and administered by the Government. Pension benefits accrue up to a maximum period of 35 years at a rate of 2 per cent per year of pensionable service, times the average of the best five consecutive years of earnings. The benefits are integrated with the Canada/Quebec Pension Plans benefits and they are indexed to inflation.

Both the employees and CIHR contribute to the cost of the Plan. The 2009–10 expense (in thousands of dollars) amounts to $4,148 ($3,827 in 2008–09), which represents approximately 2.0 times (2.0 in 2009) the contributions by employees.

CIHR's responsibility with regard to the Plan is limited to its contributions. Actuarial surpluses or deficiencies are recognized in the financial statements of the Government of Canada, as the Plan's sponsor.

(b) Severance benefits: CIHR provides severance benefits to its employees based on eligibility, years of service and final salary. These severance benefits are not pre-funded. Benefits will be paid from future authorities. Information about the severance benefits, measured as at March 31, is as follows:

(in thousands of dollars)

	2010	2009
Accrued benefit obligation, beginning of year	$ 7,591	$ 6,573
Expense for the year	1,676	1,125
Benefits paid during the year	(240)	(107)
Accrued benefit obligation, end of year	**$ 9,027**	**$ 7,591**

9. Contingent Liabilities

CIHR may be subject to legal claims in the normal course of business. In management's view, there are currently no such claims with a material impact on the financial statements and consequently, no provision has been made.

10. Contractual Obligations

CIHR is committed to disburse grants and awards in future years subject to the appropriation of funds by Parliament. In addition, the nature of CIHR's operating activities result in some multi-year contracts whereby CIHR will be committed to make some future payments when the goods or services are rendered. Future year contractual obligations are as follows:

(in thousands of dollars)	2011	2012	2013	2014	2015 and thereafter	Total
Grants and awards	$ 806,602	584,046	383,112	221,329	126,010	**$ 2,121,099**
Operating expenditures	2,297	106	48	13	8	**2,472**
Total	**$ 808,899**	**584,152**	**383,160**	**221,342**	**126,018**	**$ 2,123,571**

11. Related Party Transactions

CIHR is related as a result of common ownership to all Government departments, agencies, and Crown Corporations. CIHR enters into transactions with these entities in the normal course of business and on normal trade terms. During the year, CIHR received common services which were obtained without charge from other Government departments as disclosed below.

(a) Common services provided without charge by other government departments

During the year, CIHR received services without charge from certain common service organizations, related to accommodation, the employer's contribution to the health and dental insurance plans, and audit services. These services provided without charge have been recorded in CIHR's Statement of Operations as follows:

(in thousands of dollars)

	2010	2009
Accommodation provided by Public Works and Government Services Canada	$ 3,403	$ 3,386
Employer's contribution to the health and dental insurance plans provided by Treasury Board Secretariat	2,916	2,746
Audit services provided by the Office of the Auditor General of Canada	229	223
Total	**$ 6,548**	**$ 6,355**

The Government has centralized some of its administrative activities for efficiency, cost-effectiveness purposes and economic delivery of programs to the public. As a result, the Government uses central agencies and common service organizations so that one department performs services for all other departments and agencies without charge. The costs of these services, such as the payroll and cheque issuance services provided by Public Works and Government Services Canada, are not included in CIHR's Statement of Operations.

(b) Administration of CIHR funds by other government departments

Other federal departments and agencies administer funds on behalf of CIHR to issue grants, awards and related payments. During the year, other federal departments and agencies administered $89,302,698 in funds for grants and awards (2009 - $91,189,579), primarily pertaining to the Canada Research Chairs program. These expenses are reflected in CIHR's Statement of Operations as expenses.

12. Segmented Information

Presentation by segment is based on CIHR's strategic outcome. The presentation by segment is based on the same accounting policies as described in the Summary of significant accounting policies in note 2. The following table presents the expenses incurred and revenues generated for the main strategic outcomes, by major object of expenses and by major type of revenues. The segment results for the period are as follows:

(in thousands of dollars)	**Advances in Health Knowledge**	**People and Research Capacity**	**Knowledge Translation and Commercialization**	**2010 Total**	**2009 Total**
Transfer payments					
Grants and awards	$ 590,200	$ 275,963	$ 72,119	$ 938,282	$ 927,238
Refunds of previous years' grants and awards	(3,418)	(1,598)	(418)	(5,434)	(2,901)
Total transfer payments	586,782	274,365	71,701	932,848	924,337
Operating expenses					
Salaries and employee benefits	27,757	12,979	3,392	44,128	40,589
Professional and special services	4,432	2,073	542	7,047	5,838
Accomodation	2,140	1,001	262	3,403	3,386
Travel	2,075	970	253	3,298	3,854
Other	893	417	109	1,419	1,688
Furniture, equipment and software	775	363	95	1,233	1,733
Communication	631	295	77	1,003	1,084
Amortization of tangible capital assets	506	236	62	804	696
Total operating expenses	39,209	18,334	4,792	62,335	58,868
Total expenses	625,991	292,699	76,493	995,183	983,205
Revenues					
Donations for health research	5,748	2,687	703	9,138	10,213
Cost sharing arrangements with other government departments	-	-	-	-	150
Endowments for health research	1	1	-	2	2
Total revenues	5,749	2,688	703	9,140	10,365
Net cost from continuing operations	**$ 620,242**	**$ 290,011**	**$ 75,790**	**$ 986,043**	**$ 972,840**

13. Adoption of New Treasury Board Accounting Policies

During the year, CIHR adopted the revised Treasury Board accounting policy TBAS 1.2: Departmental and Agency Financial Statements, which is effective for CIHR for the 2009-10 fiscal year. This change has had no significant impact on CIHR's financial statements.

14. Comparative Information

Comparative figures have been reclassified to conform to the current year's presentation.